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The Massachusetts Medical Society.

THE ANNUAL DISCOURSE.

NOTE.—At an adjourned meeting of the Massachusetts Medical Society held Oct. 3, 1860, it was

Resolved, "That The Massachusetts Medical Society hereby declares that it does not consider itself as having endorsed or censured the opinions in former published Annual Discourses, nor will it hold itself responsible for any opinions or sentiments advanced in any future similar discourses."

Resolved, "That the Committee on Publications be directed to print a statement to that effect at the commencement of each Annual Discourse which may hereafter be published."

MILITARY MEDICINE: A MEANS TO PERPETUATE ITS TEACHING IN MASSACHUSETTS.*

BY P. E. TRUESDALE, M.D., FALL RIVER, MASS.

"WE are no longer a young country, to be judged apart from the rest of the world," said Dr. E. H. Bradford, in his discourse before this Society in 1899. "We are to be measured by what is expected of us. This from a land of our resources would be the greatest gift to human welfare possible in human effort. The conflict of the next century," said he, "will be against ignorance, sorrow and suffering, and in this the medical profession must be foremost in strength and endeavor." In the light of our present position among nations these words embody the wisdom of a prophet.

We are all keenly interested and concerned in the part which we may exercise as individuals and practitioners in the present situation which confronts our country. With that thought in view I wish to engage your attention upon the subject of Military Medicine and a Means to Perpetuate Its Teaching in Massachusetts. Already the whole science of medicine has been drawn into requisition, no less to prevent sickness and death of the soldiers in the camp, in the trenches and on the march, than to relieve and preserve them when wounded in battle. "It is not enough," said Mr. Chevalier in his Hunterian Oration in 1821, "that we advert to the benefits derived from surgery in the comparatively tranquil and measured course of civil life. We must not forget what it has accomplished in other and more turbulent scenes. We must turn to those seas and fields and mantling walls over which the thundering cannon has roared when fire and sword have met in awful conjunction to spur or to oppose unrelenting ambition. How many lives have been preserved, what solace and consolation have been afforded in the slow, gloomy hours of anguish by the firm and faithful hand which surgery has been enabled to stretch forth to the relief of the suffering brave."

Whenever the welfare or honor of our nation was to be maintained by battle, volunteer surgeons met the sacrifices in equal measure with other volunteer officers. The profession has never lagged in responding to the call of patriotism in the day of battle. In the Revolutionary War, Brooks, Warren, and Aspinwall were compeers of Putnam, Greene, and Knox in all the attributes of patriotism that marked the heroes of that period. Toner,[1] in an essay upon the medical profession in the Colonies during the struggle for independence, commented upon the patriotism of physicians as follows: "When the principles of free government were being evolved and matured, no class of society or profession seemed to have deserved higher praise for its efforts to promote the result than that of the physicians."

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* Delivered before The Massachusetts Medical Society, June 13, 1917.

While our European contemporaries have been facing obvious and great perils, enduring untold hardships, stanching the blood of nations and renewing man power in the face of modern warfare, we, in the serenity of our civil life, as if by some unseen messenger, are directed to join in the path of greatest service to mankind.

Heretofore the government of our country has, fortunately, not found it necessary to shape its military policy as extensively as that of the fighting nations of Europe. Without the array of military hospitals and schools of special military instruction, the United States has chosen to rely, to a large extent, upon the availability of its civilian resources for the care of the sick and wounded in time of war.

THE WAR OF INDEPENDENCE.

The earliest history of military surgery in the United States gives one a very luminous conception of the difficulties, privations, and untold sufferings that beset an army which was forced to meet, extemporaneously, all the exigencies of the sick and wounded in a war which required the aid of every citizen who had the intelligence to appreciate liberty and the courage to oppose tyranny. The army which gathered at Cambridge after the battle of Lexington was assembled without any effort of public authority. It was a spontaneous manifestation of patriotism, calling men from every station of life into immediate service. Few who thus responded believed that there would be real war. The majority of them looked forward to a compromise with the mother country, and as a result had arranged to be absent from their homes for a short period only. Physicians who came with them brought their own instruments and such medicines as they had in their offices, that sufficed during a brief period only for the necessities of the soldiers. Medical supplies of all kinds were extremely scarce and the army was ill supplied, as we learned incidentally from a resolution of Congress authorizing two surgeons who were so fortunate as to possess medicine chests, to lend them to other regiments that were not so well supplied.[2]

During the summer of 1777 the attention of the country was directed to the northern department under Dr. Jonathan Potts, where Burgoyne was advancing to capture or annihilate Schuyler's army. At one time the condition of affairs became so bad at Crown Point that only by prompt action was that portion of the army saved from destruction. Upwards of 3000 men were on sick report, and the losses from disease and desertion during the unfortunate campaign in Canada had mounted to more than 5000 men. The army was in the utmost distress for want of medicines, hospitals, stores, and surgeons; and Dr. Stringer asserted in a letter to General Gates, July 24, 1776, that the men were literally dying for want of proper care and medical attention.

In the meantime affairs were not harmonious in the hospital administration of the middle department of the army. The want of supplies of all kinds caused great suffering among the troops in the Jerseys. Three thousand men who were fit for duty were detained in various hospitals because they had no shoes. The hospital stores were scanty, and all available means of supply had been exhausted. Winter was approaching and the sick were without blankets and many of them almost naked. Stoves were erected in the hospitals and all the hospital wagons employed in the transportation of fuel, so as to make up for the scarcity of blankets and clothing; but these efforts failed to check the growing discontent against the management of the medical department. The sick could not believe that their distress was the necessary result of the impoverishment of the country, and they were often allowed to believe that they suffered in order to enrich those high in authority.

The winter of 1779-1780 was very severe and the soldiers sick in tent hospitals endured many hardships. Private houses were used and the soldiers suffered from crowd poisoning. Hospital fever and dysenteries became prevalent. However, in this war of unprecedented marvels, sheer depravity in many departments of the army was unavoidable, but ingenuity and resourcefulness characterized an oppressed people. Dr. James Tilton of Delaware caused to be built a large number of log huts, built roughly so that air could freely penetrate the crevices. They were without wooden floors, the ground being hardened or baked by heat, and each hut was designed to accommodate five or six men. The fireplace was in the center of the hut and a hole left in the ridge to permit the exit of smoke. The plan was found to be very successful. The mortality from typhus diminished very decidedly, and the general results were so good as to warrant the introduction of the system throughout the army.

On September 3, 1783, peace was established with Great Britain, and two months later the American Army was disbanded. Whereupon the country was left practically without an army, and the price of a false security was soon paid. The Indians on the frontier manifested a hostile attitude. A regiment of infantry under Lieut.-Col. Josiah Harmar of Pennsylvania had already been defeated by the Indians. General St. Clair succeeded Harmar, and with a new force undertook an active campaign against the Indians. He, in turn, was defeated, losing more than six hundred killed and two hundred wounded.

WAR OF 1812.

During the period immediately preceding the War of 1812 it was apparent that in point of corps organization the medical department was notoriously deficient. No wisdom had been learned from the vexatious controversies of revolutionary days between the general and the regimental staff, inasmuch as the surgeons of the Revolutionary War had left few records of their experience. The management of military hospitals, the hygiene of camps, the diseases common among troops, and the surgical conduct of campaign were topics of which the profession of the country was entirely ignorant. When the certainty of war with Great Britain was realized, Congress hastily provided for an increase in the army and a corresponding increase in medical officers. The country at this time was poorly provided in all the essentials necessary for the formation of an efficient army. A long period of comparative peace had resulted in a decadence of military science, and the errors and hardships of the early campaigns had been forgotten. Most of the army officers who served in the struggle for independence, whose counsel and assistance were very much needed at the time, were dead or superannuated. The army organization was not a reality; the staff departments were sufficient for a force of not more than two or three regiments.

When the army mobilized at Greenbush, New York, Dr. James Mann of Massachusetts was ordered to superintend the Medical Department of this northern army. In reciting the difficulties which he encountered he says:[3]

> "The mere organization of hospitals was the least perplexing part of duty. The illy defined powers, with which the hospital surgeons were invested, even in their own department, subjected them to many disagreeable interferences of the officers of the line. Collisions will always exist between officers of different departments of an army when their several powers and duties are not explicitly pointed out. Officers, tenacious of authority, assume as much as may be implied by rules and regulations. In addition to multiplied embarrassments, the various duties attached to the office of hospital surgeon, with those merely professional, were always so pressing, that little time was allowed to record, particularly, the diseases and medical transactions of the army, as they occurred."

In the fall campaign the sick at one time numbered 720 men at Plattsburgh. As the battle front was approaching this district and the sick could not be protected within the lines, they were transferred to Crab Island, two miles distant. No accommodations had been provided for them, and for three days they remained exposed to the wet and cold. Whereupon the surgeon in charge, Edward Purcell, had these patients transferred in open batteaux across the lake to Burlington. The hospital at Burlington was not large enough to accommodate this influx of new patients, but they were admitted, and the ill effects of crowd poisoning soon became manifest in the form of typhus and dysentery.

Early in 1815 peace became an accomplished fact, and on March 3 an act was passed reducing the entire military establishment to ten thousand men and the medical department to five surgeons and fifteen mates. Although the medical department of the United States army during this war was neither adequate nor efficient, they succeeded by unnecessary and untold sacrifices. The nation was at once satisfied to allow this important department to drop back into a state of lethargy. As in the Revolutionary War, there is ample evidence of the skill, devotion and the capacity of individual members of the profession. Hospital-surgeon Mann, Medical Director of Plattsburgh, reports from that place in November, 1814, to Surgeon-General Tilton:[4] "In events of high importance it is seldom that the medical staff is noticed. This is discouraging to the ambitious young surgeon of the army. It may be alleged, the surgeons being non-combatants, are out of danger. This however is not always the case. During the investment of Plattsburgh by the enemy, the surgeons were constantly passing from fort to fort, or block houses, to dress the wounded, exposed to a cross fire of round and grape shot; while the greater part of the army was covered by fortifications. The cool bravery of the surgeons was noticed by the commander-in-chief." Continuing the report, Dr. Mann writes: "I feel myself bound to report, with much respect, the conduct of all the medical gentlemen attached to this army, who have at all times during this campaign performed their duty; and who, for their particular services, during and after the investment of Plattsburgh by the enemy, merit the applauses of their country."

There were continued efforts toward retrenchment in the medical department during the period of peace which followed the War of 1812. Surgeon-General Lovell, whose faithful and economical administration of his department was a matter of universal commendation, appealed again and again to the Hon. J. H. Eton, then Secretary of War, for an increase in the number of officers in the medical department. His petitions were followed by recommendation from the Secretary of War to the military committee of the House that:[5] "The Surgeon-General of the Army might be dispensed with. . . that he had no responsibilities to encounter; that his duties were essentially performed by a quartermaster of the army at New York." The subsequent controversy which followed this recommendation resulted, fortunately, in a victory for the Surgeon-General. If one's imagination were to run riot it could not overdraw the picture of demoralization in the medical department which would have occurred during the Civil War under such sinister influence.

THE MEXICAN WAR.

At the onset of the Mexican War, May 13, 1846, the army was found to be grossly inadequate in numbers and equipment. A call was made for fifty thousand volunteers. For the medical department one surgeon and one assistant surgeon were assigned to each regiment. Subsequent events proved that the volunteers were indiscriminately accepted, and the volunteer surgeons who entered the service with little or no military knowledge, with an occasional honorable exception, were inefficient.

In the progress of the army towards the city of Mexico the health of the soldiers was far from satisfactory. "It found in the disease of the country," wrote Surgeon Satterlee, "foes more to be dreaded than the Mexican troops." While a large proportion of the soldiers had become incapacitated on account of their unacclimated state, the great majority of the sick, as indicated by the reports of Satterlee and Tripler, resulted from hasty preparation, indiscriminate selection of volunteers and a lack of knowledge of medico-military science in the army medical organization.

However, individual examples of heroism and resourcefulness characterized the medical men of the U. S. Army in this campaign, as in former wars. Major-General Worth, in his official report of the operations of his division on the Molino said: "It is again my gratifying duty to present to the general-in-chief for commendation the names of those ever faithful and accomplished medical officers, Satterlee, Wright, Simpson, Simons, Dyerle and Roberts. Soon after the surrender of the Mexican forces at the capital, our garrison which was left at Pueblo, consisting of eight hundred men and eighteen hundred sick, wounded, and disabled in the hospital, became surrounded by large bodies of guerillas and several thousand Mexican troops. The affair assumed the importance of a siege, and lasted from the 13th of September to the 14th of October before relief was obtained." From the official report of Colonel Childs it would appear that the surgeons and their assistants in this campaign were worthy to rank among the bravest warriors in history. His report in part was as follows:

> "To Surgeon Mills, Chief of the Medical Department, and to his assistants, great praise is due for their unwearied and laborious services. Left with eighteen hundred sick and limited supplies, with but six assistants, their utmost exertions were necessary to administer to so many patients. These gentlemen were not only occupied in their professional duties but the want of officers and men compelled me to make large requisitions on surgeons and invalids for the defense of the hospitals and they were nightly on guard marshalling their men upon the roofs and other points."

Surgeon William Roberts, by virtue of his skill as a medical officer and his personal bravery, became a conspicuous figure in the war. Col. McIntosh of the 5th infantry thus mentioned him in his official report of the battle of Churubusco: "His talents and zeal were not alone confined to his profession, but were displayed in a military capacity in urging on the men to the contest." Dr. Josiah Simpson, in a short narrative presents a final picture of this brave officer marching gloriously to death in the charge on the Molino. All the officers of one company having been shot down, Dr. Roberts took command and was mortally wounded in the assault. He was struck by a musket or escopet ball on the temporal ridge of the frontal bone, about two inches above the left supra-orbital arch; the ball glanced, fractured and carried away a portion of the frontal bone, leaving the brain exposed. Abscesses which formed in the cavity of the cranium caused his death. In the army reports there is evidence that Dr. Roberts possessed unusual attainments as a surgeon as well as a soldier, and among the unique figures which have adorned the medical department of the army, he ranked with Warren, Brooks, Jones, Fuller and Trowbridge of the previous wars.

THE CIVIL WAR.

At the outbreak of the Civil War the medical corps consisted of a surgeon-general, thirty surgeons and eighty-three assistant surgeons. Promotion, being by seniority of service, could not follow as a result of high qualification. "The tendencies of this system," wrote Jenkins,[6] "repressed the promptings of professional ambition and favored contentment in the dry path of old routine."

A special commission of medical men presented a bill to Congress which became a law on April 16, 1862, introducing new features of the greatest value into the organization of the medical department, besides greatly increasing the number of medical officers. One feature of the law provided for the selection, according to merit and eminent qualification, from the whole number of medical officers in service, whether of the regular or volunteer army. This was said to have been the first instance in which legislation inspired the ambition of members of the medical staff by associating their achievements with the rewards of a laudable ambition. As a result of this law, Dr. William A. Hammond, an assistant surgeon, became surgeon-general of the army. He introduced liberality and promptness in the purveying department; he substituted airy and ample hospital buildings for old hotels and seminaries, and raised the scientific standard of admission into the army medical service.

Approximately 12,000 medical men who served the country with remarkable credit were mustered into service between April, 1861, and the close of the war, for an army of 2,213,365 men. In the annual report of the Surgeon-General for 1865 he says:

> "In conclusion I desire to bear testimony to the ability, courage and zeal manifested throughout the war, by the officers of the medical department under all circumstances and upon all occasions. With hardly an exception they have been actuated by the highest motives of national and professional pride

and the number who have been killed and wounded bears testimony to their devotion to duty on the field of battle."

Thirty-two surgeons were killed in battle and nine by accident. Eighty-three medical officers were wounded in action, ten of whom died. Four died in rebel prisons, seven of yellow fever and two hundred and seventy-one of other disease, making a roll of honor of 406 names of those who are commonly considered not to be exposed to the dangers and chances of war. Some conception of the amount of work done by the medical officers during this war may be gleaned from the report, which states that 1,057,423 cases of wounds and diseases occurring among white troops were treated on the field and in the regimental and post hospitals. In the medical and surgical history of the war in the Surgeon-General's office we find that of 304,369 deaths during the war, 44,238 were killed in battle, 49,205 died of wounds; 526 were suicides, homicides or executions; 186,216 died of disease; and 24,184 died of unknown causes. It is worthy to note that approximately 60% of all deaths was due to disease.

The willingness on the part of Secretary of War Stanton to respond promptly and in full measure to the demands of the Surgeon-General, together with the ability of these two officials to coöperate intimately and in the most skillful manner, contributed greatly to the success of the medical corps.

There were many noble specimens of a surgical character developed during this carnage of a nation. Letterman became distinguished for the perfection of a trained ambulance corps. Flint and Gross revolutionized field surgery, and their methods have been copied by all civilized nations. Hammond encouraged scientific investigation, fostered army medical societies, established a museum of pathology and promoted a compilation of the medical and surgical history of the war,—movements of unprecedented value in the direction of medical progress. Barnes, as Surgeon-General, established the right of medical officers to command within their own field of action; White, a hero, was slain on the battlefield of Antietam; and Wood, Porter, and a host of others might be mentioned.

The Surgeon-General attested the respect and gratitude of the medical staff to the Secretary of War in his report for 1866:

> "It is a matter of just pride and congratulation to the medical profession throughout the civilized world that your deep interest in the health and hygienic conditions of the army, your constant vigilance and most liberal assistance in all that could in any manner conduce to the greater comfort and welfare of the sick and wounded, and your official recognition of faithful and meritorious service by officers of this department, have been responded to on their part by redoubled exertions, unfailing devotion to duty and an *esprit de corps* that secures to it professional talent of the highest order. Letters from the most eminent surgeons and physicians in Europe, in acknowledgment of publications from this office, do not express more astonishment of the magnitude of the war, than admiration of the unvarying support and encouragement extended to the Medical Staff under your administration of the War Department."

There are few pages in the history of the United States more splendid and significant.

THE SPANISH WAR.

The military peace establishment which followed the Civil War declined in force up to the crisis with Spain in 1898. The appalling list of sick in the summer camps during the Spanish War and the deplorable condition of affairs at Santiago were the inevitable consequences of a medico-military policy that had become mouldy. Under tents in the hospital yards of Boston, as many of you remember, there lay scores of ghastly bodies of the sick from squalid and unsanitary training camps. Authorities agree that haste, lack of preparation and the service of amateur medical officers were fundamentally responsible for the 2000 deaths in camp and the hordes of sick men. Lieut.-Col. Munson, in a recent editorial in the *Military Surgeon,* under the title of "Then and Now," discloses a situation during the Spanish War which was a discredit to a nation exhibiting a form of government which, though serene in times of peace, presented a crooked path to safety in a conflict of arms that was anything more than a feeble war. For it must be remembered that in this war we were fighting a nation which had traditions, but was incomparably inferior to our own in men and resources. He calls attention to the fact that a number of very good physicians were appointed from civil life as Corps, Division and Brigade Surgeons, and that not one of them had the most remote idea of the duties of these offices and resented assignment to the immediate care of the sick, which duty alone they were qualified to perform. "A thousand things were wrong and very little right, except the stout hearts of the good old soldiers," wrote Munson. "These did their duty and died after winning the war. Their comrades of the camp died, too; not in the fierce charge or stubborn retreat, but in rotten, ill-managed bivouacs, immobilized in their own infectious filth. Our President then postponed, even as our President now was forced to postpone the fateful declaration of war, because he knew we were not ready. But the people demanded action no matter the cost and—they paid the bill."

NEGLECTED EXPERIENCE CONFRONTING REALITY.

The value of history is to be found in the lessons that it teaches. A knowledge of military affairs that is particular is not required for the student of history to autopsy the dead periods in the military policy of the United States. Legislating the army and its medical arm into a grossly inefficient body for any emergency has been a conventional practice after each war, for more than a century. Every era of peace has been characterized by retrenchments and comparative inactivity until a condition akin to scurvy has systematically characterized the war department during such intervals. At the close of the Revolutionary War it was felt by the people that the immense armies of Europe were chiefly used to preserve the balance of power on the continent or to overawe the people, and were considered unnecessary in a republic separated from all possible enemies by a broad ocean. In his farewell address to the American people Washington admonished them always to maintain suitable military establishments for adequate defensive positions. His importunities were not heeded and the army was disbanded. The result, as previously detailed, was a few short dark pages in the history of the nation. Thomas Jefferson, in commenting upon the risk of relying always upon soldiers trained in emergency, warned the country in the following words: "It proves most forcibly the necessity of obliging every citizen to be a soldier. This was the case with the Greeks and Romans, and must be that of every free state. We must train and classify the whole of our male population. We can never be safe until this is done."

An unbroken line of leading statesmen and soldiers, from Washington to General Leonard Wood, have petitioned the nation in favor of universal service. "We should never again be found to be willing for war but not ready for war," said Dr. Wood, before the Senate Committee on Military Affairs, in exposing the depravity of our common needs for defense, after the world's greatest war had been two and one-half years in progress. Presenting still other truths which common sense has placed beyond contradiction, he said: "Its lessons as to equipment, development of arms and munition are an open book to the world. No amount of money and no amount of effort can purchase time and make good its loss." On this same occasion this commander referred to the enthusiasm commonly manifested by our people over some new form of torpedo or a general discussion of the organization of our reserves, but he indicated their failure to grasp what should be the main thought,—that it takes a long time to prepare the absolute necessities for war. "People fail to appreciate," continued Dr. Wood, "that these common necessities must be gathered in times of peace, and the organization of all our resources should be engaged in maintaining the supply once war is upon us."

These thoughts are not new, but they are more solemn just as we realize that we have not chosen to depend upon an intellectual preparation of our own. It may be that our over-refined spirits have become habituated to a state of ease and a sense of security as the result of long freedom from war's perils. Consequently there has developed among us a repulsion and loathing for the whole business of war now that it has degenerated to a level of bloody ruthlessness, fiendish ingenuity and insensate cruelty. This is confirmed by the fact that our military policies have been screened and approached only with the widest margin of political safety. In no war of the last century have the lessons of inefficiency served to increase the pace of our sluggish war machine. Now we find that war with all its ramifications, so profoundly hated by us and so long repudiated as an anachronism, actually confronts the nation.

When England declared war in 1914, Mr. Britling, imbued with patriotism, went to London to offer his services. He had no idea what arm of the service to go into. He wanted to help; that was all. He wanted to do whatever the government thought he was best fitted to do, whether it took him to France or kept him in London. For two days he wandered about seeking information. He found no disposition to welcome him. His own keen determination to do something for his country was blunted by a perplexing "how?" At last, tired and disgusted, convinced that the nation at large must take hold of the government it had so long neglected, he returned to his home in the country still unassigned for duty. There are many Britlings in America, but happily for American zeal they do not go as far afield nor run amuck. The man who volunteers soon disappears from his old haunts. The surgeon is accepted with a promptness that is unnerving. Few of us are any better prepared than Mr. Britling, but willing men among us are not found adrift.

THE ISSUE.

Now that we are embarked upon war; now that the proverbial appeals of the pacifists are at least temporarily shunted; now that we no longer dare trust in a divine Providence which singularly in this war had not seen fit to stand by weak nations; now that the old *apparatus belli* is forced into the hands of our young men, college men largely, who, though questioning momentarily the sagacity and far-sightedness of their elders, sign up and enter the crusade with a vengeance;

> "So nigh is grandeur to our dust,
> So near is God to man,
> When duty whispers low, Thou must,
> The youth replies, 'I can.'" *Emerson.*

Now that these young men have gone, many of them to exchange their places in the class album for records on the roll of honor; now that some have publicly appealed for a fair chance, not necessarily to live, but to die to some purpose, to die with the thought that what they give, life itself, may not be entirely in vain, may we not ask for a fair chance to meet this human price of war? We are chosen to construct and reconstruct the builders and destroyers of nations. Is it any less imperative and urgent that we are properly instructed in the ground principles of military medicine? Should the physician be expected to bolt his practice and outstrip the wind? "An officer of the line may soon learn the duties of the field and a surgeon be amply qualified for his profession, and both of them be worse than useless in the army," wrote Surgeon-General Lovell, after the War of 1812. "For there can be little doubt," continued he, "that where one man has died from improper medical treatment, ten have been destroyed from want of knowledge of the many duties peculiar to the army surgeon." The wise counsel of the "lamented" Lovell has been proclaimed again and again for a century, but never heeded.

The fundamentals of our education have been directed along avenues for success in practice, teaching and research. Individualism and independence prevail almost without margin. We glory in the liberal exercise of that principle, charity, and in the breast of every physician there dwells hope, yes eagerness, to contribute something to the welfare of mankind. But the average American physician has recognized no duty to the State. Never until war times arrive is he enlightened upon the subject of national service. Until within a few years our government has not been interested, helpful nor solicitous of the welfare of medical men except in war periods. The martial element in a man's position who must respond to the "tap of the drum" and the "word of command" for a lifetime has not appeared to be congenial to the tastes nor tributary to the progress of men of study and science.

So it is apparent that medical men in the aggregate and the nation have not existed for each other. Surely the heroic men of science, who have gone to their death through a desire to aid mankind, would have it otherwise. Donnelly, who volunteered to fight typhus among the Serbian soldiers and died of that disease in that service; Ricketts, who gave his life for humanity and science while investigating Mexican typhus; McClintic, who died in his early manhood from the Rocky Mountain spotted fever while investigating that disease in the Bitter Root Valley of Montana; and Lazear who, like the ancient Roman who thrust his hand into the devouring flame, calmly let a mosquito remain on the back of his hand until it had inserted the organisms of yellow fever, from which this physician died,—these men and hundreds more of such martyrs in humanity's service would have us enlightened, booted and spurred for the task ahead.

While the medical profession acknowledges its obligation to be prepared for this species of public service, and its members hold themselves ready for the duties of the field whenever their country calls, the country, in turn, must reciprocate the benefit by indicating its purpose to elevate the profession and coöperate with medical schools in providing the necessary resources to make the student conversant with the military contingencies of his vocation.

It is my purpose, therefore, to urge that you subscribe to a plan which should have a far-reaching influence in the education and training of medical men to measure up to the demands of war. Briefly, it involves the foundation of a chair in military medicine in our largest medical school. The need presents itself now as visible and vital. The task of converting the medical profession almost overnight from civilian practitioners into all the mysteries of medico-military science is proving to be stupendous. Some conception of the nation's requirements may be gleaned from reports indicating that with the first 500,000 men will march the entire trained medical personnel of the nation and 2000 additional volunteer medical officers. The next 500,000 troops would be at the mercy of an additional 3500 green medical officers. An army of 5,000,000 men would require the services of 35,000 medical officers. Should there be great naval activity this fighting department would need medical officers in equal proportion to that of the army. There are 147,000 physicians in the United States and nearly, if not every one, was graduated from his medical school and hospital without hearing reference to this possible contingency.

Capt. Mahlon Ashford, in a recent article[7] on organization and training of military men, says: "It is a great task to gain the attention of the vast and diverse audience composed of American physicians; an even greater one to convince them of any general necessity for a military education or military service of any character for American doctors in time of peace." The compelling want of a change of spirit, he indicates in the report of Sir A. Keough, Director General of the British Army, in speaking of the expansion of the British Medical Service in this war: "The burden of responsibility thus placed upon the medical profession could not have been assumed but for the preparation made in peace, for the nucleus of trained officers in so large an army medical corps as the country now possesses would have been too small had the old conditions prevailed. As it was, the country was able to take the field with a larger number of experts in administration than it has ever before possessed, but this meant that owing to the magnitude the war so quickly assumed, nearly all the officers of the medical corps were required to give their attention and their energies to administration, leaving to specially selected experts the technical work which the care of the sick and wounded required. Hence the appointment of consulting surgeons by whom all subsequent surgical development can be determined. The internal organization of the medical units; the formation of cadres for the battalions; the establishment of hospitals at home and the formation of those abroad; the provision of doctors, nurses, drugs, instruments, dressings; the equipment of ships and trains. If to these is added the mass of work connected with the supervision of recruiting for the new armies, their housing, and the sanitation of camps and barracks, some idea will be gained of the scope and relation of medicine to the art of war, and the part played by medical men will be realized."

In respect to its medical arm, it is apparent that the British Empire has heeded the lessons of the Crimean War. Bullets killed thousands in that great conflict, but disease, in its silent approach, swept off tens of thousands. Baudens,[8] in his account of the expedition to Crimea, says: "General Yussuf had resolved by a night attack to fall suddenly upon the troops assembled around Babadagh, but at the moment the order for departure was given, at about six o'clock in the evening, five hundred men lay stretched upon the earth, unable to rise. Cholera had fallen like a thunderbolt upon the expeditionary column. At eight o'clock there were one hundred and fifty dead and three hundred and fifty dying. The pestilence continued its ravages, and the expedition had to be abandoned."

Before the Crimean War, England, like the United States today, had but one chair in military medicine in the whole country, yet she numbered many brilliant surgeons within her realm. As in former wars, she had enlisted the services of such distinguished surgeons as the Hunters, the Coopers, Bell, and Guthrie, so during this period of the Crimean War she secured the aid of Paget, Simpson, Ferguson, Erichsen, Spencer Wells, and a host of others. In this war, however, the one outstanding figure, whose distinction was unparalleled, was Florence Nightingale. Prior to her departure for the battlefields, she had made a tour of study of the hospitals of England, and found their sanitary management was deplorably deficient. She journeyed to France, Germany and Italy for instruction, and in the large military schools and hospitals of these countries she equipped herself with a knowledge, the application of which gave her a position of pre-eminence among the brilliant ornaments of a great profession. At this time there were professorships in military medicine in Paris, Mentz, Lisle and Strassburg. Cardinal Richelieu in his period had established a military hospital in every fortified city of the kingdom. From the conduct of France in the present war you will agree that the foundation in medico-military medicine, established by Richelieu, and advanced by Ambrose Paré, Percy and Larrey,—still lives to secure the pillars of that nation's preservation.

It was a saying of Frederick the Great that fever cost him more than seven pitched battles; and it has been an axiom with most military leaders that more campaigns are decided by sickness than by the sword. Dr. Hermann M. Biggs, who has recently returned from France, has stated that 86,000 soldiers have had to be removed from the trenches because they were incapacitated on account of tuberculosis, and that the alarming increase of the disease in the army was largely due to imperfect medical examination of recruits, which allowed those who were affected to pass.

No more phrases are necessary to prove that the soldier is a costly piece of national property. He is not made in a day. It takes time and about $1200 a year to develop in the recruit the proper attributes of a soldier, and no species of property suffers more from neglect and inattention. For his well-being the medical officer is immediately responsible from the time the recruit is mustered in until he is discharged from service. The art of keeping the soldier efficient is the all-important factor in war.

Are we not, therefore, justified in the fullest measure in making an appeal that the opportunities for instruction in military medicine which have been denied us, be given unsparingly to all succeeding generations of medical men?

We look upon our own emergency preparation, consisting of an interrupted course of lectures at Harvard Medical School, in a spirit of sorrow. Thankful for the instruction that was given, our feelings are, nevertheless, mixed with disappointment, uncertainty and anxiety. The "fighting edge" among men is less easily acquired in the fourth and fifth decades of life than it is in the formative years. To be deep rooted, the spirit of national service should be inculcated when the mind is plastic. A life that is moulded and fixed in peaceful enterprise recoils at the thought of new formations for war.

A place for medico-military instruction in all of the recognized medical schools of the country has been recently advocated by many recognized authorities. Dr. Franklin H. Martin, representing the Council of National Defense, and Dr. F. F. Simpson, of the Advisory Committee of Civilian Physicians and Surgeons on Medical Preparedness, have encouraged the medical schools to introduce courses in Military Sanitation and urge the students to participate in them. Capt. Mahlon Ashford in his Welcome Prize Essay, published in the *Military Surgeon* for February, 1917, presents incontrovertible facts to indicate that the proper place to begin the instruction of medical men for military emergencies is the medical school. "Here," he writes, "we can reach every potential doctor, not an occasional one, as under the present system. . . and the period of medical student life is the one time when the physician can interest himself in acquiring military essentials with least personal and professional sacrifice."

Lieut.-Col. Munson, in the course of frequent editorials in the *Military Surgeon*, advocating some plan of military instruction in medical schools, urges that every candidate for a state license should pass examinations in military sanitation. Thus far let us grant the principle that in the curriculum of every medical school there should be a department devoted to military medicine, surgery and sanitation.

In the National Defense Act of 1916 all reputable schools and colleges are encouraged to have military training for their student body. Yet Dr. H. D. Arnold, as Dean of the post-graduate department at Harvard Medical School, informs us that in July, 1916, he was unable to obtain an army officer in New England or elsewhere, either on the active or retired list, to give a course of lectures. It obviously required ingenuity and determination on his part to obtain Lieut.-Col. Chamberlain for a period of six weeks during the present year. In a department of the medical school curriculum for which so much importance is now and will continue to be justly claimed, should its mechanism be hampered by the vagaries and uncertainties of political administration? If all medical schools recognized by the American Medical Association, seventy in number, adopt courses in military medicine, the demand for instructors will always be pressing. The personnel of the department must be left in some measure, at least, to chance. Unless all precedents fail, the proverbial demands for economy in periods of peace will be met with retrenchments; and unless we are approaching the millennium the same nightmare of "public opinion" will be flaunted in Congress to curtail, or inhibit, the real value of the Department of Military Medicine in the Medical School. In order to prevent such embarrassments, and to establish a department for instruction in military surgery upon a high standard and there perpetuate it, there should be an endowed chair. The occupant should be selected by the faculty of the school, and retained or dismissed according to their judgment of his capacity. That intimate coöperation between the school and the Surgeon-General's office would obtain at all times, is not to be gainsaid. But the assurance that the military department in the medical school would continue its function in peace times is the principal justification for its foundation. Only by the endowment of a professorship can this be secured. In so far as I can ascertain, there is but one professorship in Military Surgery in the United States, that held by Col. Louis A. LaGarde, M. C. U. S. Army, retired, in the New York University. There is not an endowed chair in Military Medicine in this country.

It is my hope that the Massachusetts Medical Society will initiate and sustain a movement to establish a Chair in Military Medicine at Harvard Medical School. For the successful prosecution of this method of dealing with our new obligation in this important field of education, the current war period is most opportune. The watch-word of today is "preparedness," but in peace times every known resolution to prepare for possible war has suffered from blight. The nation now exhorts us to plant seeds of everything useful that grows. The seeds for enlightenment of future generations of medical men should be sown today. We know that the selection of the seeds and the soil and the grangers settle the question of the harvest. If we may call upon the friends and patrons of the healing art to aid us in producing the seed, Massachusetts, which sprung from a seed that resolute men planted on the shores of the American wilderness, will furnish the soil and the grangers. A fund of one hundred thousand dollars is needed. With the indication for its beneficent purpose so clear cut, there could be no more auspicious occasion than this upon which to render our appeal. If this war does not open men's ears to the bigger lessons, what will? Nobody remains in this great society, at least, who needs to be convinced of the incompetence of medical men for impending service; neither does anybody remain to be convinced that we are face to face with the most powerful and fiendish war machine known to history. Conviction, then, should lead to action, for is not this war compelling the peoples of the whole world to listen, to admit the truth, however bitter, and set their house in order as for the day of wrath?

This society has a record of hard work, well done for more than a century. Its leading function under its charter is to provide well-educated physicians and surgeons adequate to the wants of the community. It was founded by men who voluntarily relinquished their employments and the joys of home that they might aid in securing the freedom of their country. Adams, Holten, Warren, Holyoke, Baylies, Tufts, Rand, Bartlett, Danforth, Dexter, and sixty others, having just "emerged from physical vassalage," lost no time in constructing the pillars of this institution. Their prudence and sagacity are as easily traced in the archives of science as in the cabinet or on the field. The public estimation of the Massachusetts Medical Society was manifested at one time through the government of the State by a grant of a township of land[9] in order to extend its beneficent work among the people. In every period since the Revolution one may find within its ranks the names of eminent physicians and surgeons, who were distinguished as philosophers, scientists, teachers, civilians and soldiers.

Each year many of its members pay the universal debt, and among those who have departed since the last anniversary meeting, two, at least, were familiar and esteemed figures before this audience. It is most fitting that we should pay a tribute of gratitude and respect to the memory of our former president, Dr. Charles F. Withington, who conducted these exercises one year ago. His name is worthy of distinction among the men who have labored in the service of this organization. We may be thankful for his tactful courage, which could fight and win. With it he gave a tone and direction to public opinion. Zeal, courage and industry characterized every phase of his career, and freely do we pay homage to his life, which steadfastly toiled for our common good.

Aside from the product of genius, the greatest achievement of life is the effulgence of a noble character. In that relation we think of Dr. Walter J. Dodd. In his death we may chronicle the passing of a martyr in the cause of science. Beyond the moral influence of that sacrifice is the outstanding example of character that withstood serial assaults of painful disease with no apparent abatement of his good nature. He was most able in the eye of the profession, but humble in his own. Stoic fortitude prevailed in Dr. Dodd's daily life, and his character is an example to all mankind. Wherever it is known, and the circle is wide, it heartens men in vivid recognition that usefulness without selfishness is the example among men which a whole world craves to imitate today.

Mr. President and Fellows: Today the opportunity presents itself for us to do something material to commemorate the faithful, yes, the liberal services of these men. In the avenues of their wisdom, from Holyoke to Withington, the people of this Commonwealth have safely confided for one hundred and thirty-six years. The events in their lives not only bring home the sensation of a common loss, but carry with them a hope that we may be more forcibly reminded of our common interest and the needs of safeguarding the priceless legacies of our deceased worthies.

This opportunity to establish a Chair in Military Medicine in Massachusetts for the conservation of their gifts is a rare privilege, which comes to us only while our country is overspread with the gloom of war. The Surgeon-General has given his approval of the plan, and the coöperation of the medical department of Harvard University is assured. Let us then, inspired by the heroic sacrifices of the men of the past, and prompted by a common knowledge of our present needs, rise to the occasion and promote this contribution, to the lasting honor of our Society, to the credit of our Commonwealth, and for the elevation of the standards of our service to the Nation.

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Original Articles.

GASTRIC AND DUODENAL ULCERS.*

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IN his oration on surgery before the American Medical Association in June, 1900, my father first advocated excision of the ulcer-bearing area of the stomach for the cure of gastric ulcer. He urged it as theoretically ideal, preventing as it does future hemorrhage, perforation, hour-glass stomach and malignant degeneration. This seemed, for the times, radical surgery, since medical men generally were still treating gastric ulcers without the help of surgery and practically everyone believed that it was only a small percentage, at the most one quarter, of the total number of cases, that came within the surgical domain.

Since 1900 rapid strides have been made in gastric surgery, made possible by physiological, pathological and clinical progress, a large part of the latter being due to the development of the Roentgen-rays as an accurate method of diagnosis of the gross lesions of the stomach, so that today surgery can and does cure the majority of gastric and duodenal ulcers, if the surgeon is called in time to prevent the complications of hemorrhage, perforation, hour-glass stomach, and malignant degeneration; and even 30 per cent. of gastric carcinomata are being cured in the hands of the Mayos, because excision of the ulcer-bearing area has come to be recognized as the operation of choice since it removes the ulcers in the stage where it is impossible to differentiate early cancer. This can be done only by the microscope. Progress such as this is most encouraging, since approximately 75,000 people die annually in the United States of cancer, and about one-third of these, of cancer of the stomach.

Etiology. Despite the work of many investigators the cause of gastric ulcer still remains undiscovered. It is manifestly impossible to discuss each of the many interesting theories that have been advanced. One of these, infection, appeals generally to clinicians accustomed to treat the same process in other parts of the body due to this cause. It is easily conceivable that such infection may occur from the appendix, tonsils, or mouth, as has been suggested. The work of Rosenow, Steinharter, Turck, Singer, and others, lends weight to the opinion that infection may be the direct exciting cause, although others have failed to produce typical ulcers by infection (Wilensky and Geist, Caller and Thalheiner). That there are other factors involved seems probable. It is reasonable to suppose that the action of the gastric juice has something to do in the conversion of a "peptic" into a chronic ulcer. Here again laboratory workers disagree. There is evidence that such is the case (Bolton) as well as that which seems to prove the contrary (Dragstedt).

The diagnosis of ulcer, either gastric or duodenal, is not ordinarily difficult. "Indigestion" and pain in relation to food intake are still recognized as the leading clinical symptoms of both types of ulcer, gastric and duodenal. In the former, pain comes on from a half to one hour after eating, while in those suffering with duodenal ulcer, pain is worse on the empty stomach three to four hours after eating and is relieved by eating; so-called "food ease," thought to be so characteristic of this condition. Vomiting depends a great deal on the presence of pyloric obstruction and is, therefore, not dependable as a symptom of ulcer. It may be entirely absent. Haematemesis is a big help, of course, in the clinical diagnosis, as is melena, coupled with a history of previous indigestion. But hemorrhage is a complication and not a symptom, so we must not expect it or wait for it, to make a positive diagnosis. We have not found the strictly localized pain area always present in gastric ulcer, though it is emphasized as characteristic by Leube. Pain in both gastric and duodenal ulcers is more apt to be a general soreness referred to the entire epigastrium and often to the back.

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* This paper takes the place, and is based on the material, of one read by the author's father, the late William L. Rodman, A.M., M.D., of Philadelphia, before the Surgical Section of the Suffolk District Medical Society, at Boston, Dec. 15, 1915.

W. J. Mayo has well stated that importance should be attached to the findings in any case of gastric or duodenal ulcer in the following order:

a. The history.
b. X-ray findings.
c. Physical findings.
d. Laboratory findings.

Graham found that 72 per cent. of the cases of duodenal ulcer gave a characteristic history while 71 per cent. of gastric ulcers did so. It is impossible to tell clinically with any degree of accuracy whether or not an ulcer is undergoing malignant change. Indeed this differentiation is almost as difficult after the abdomen has been opened. If W. J. Mayo, with his enormous experience in gastric surgery, finds it impossible to distinguish at operation between a chronic ulcer and one that is beginning to undergo malignant change, then surely others with less experience will have the same difficulty. Dr. Mayo has said in a personal communication to my father that "in three cases out of four when we remove a suspicious ulcer it proves to be a carcinoma, and a number of cases after gastroenterostomy for supposed ulcer have developed carcinoma so quickly as to make it almost certain that it had existed at the time of operation." Smithies, who has also had a large experience in the diagnosis of gastric diseases, states: "It should, however, be firmly emphasized that, in a given chronic gastric ulcer, we have at present no means at our command that enables us to tell which chronic ulcer is destined to pursue a benign course and which will become malignant."

One may surmise that malignant degeneration has taken place if anorexia becomes pronounced, the pain more constant, the attacks of haematemesis more frequent, the vomited blood darker. Tuffier described a type of ulcer as latent "Ulcer-Cancerous almost from its beginning. Here the symptoms of ulcer are absent or are present in very slight degree, such as mild dyspeptic disturbances which may last for a number of months. After a short time however, the signs of cancer develop rapidly, there being complete anorexia, vomiting of dark blood, considerable anemia and rapid deterioration of the general health.

Oettinger, who has carefully investigated this subject, while admitting the impossibility of making an accurate diagnosis of beginning malignancy in a majority of instances, states: "There are, however, certain circumstances which may lead one to suspect malignancy; thus, if pain persists, despite the employment of dietetic and therapeutic measures, which generally control it in acute ulcer, and continues to be present late in the disease, we may justifiably expect that the lesion is not benign. The character of the pain is neither that of simple ulcer, which is so commonly relieved when the patient vomits, or assumes a special position, nor is it that of cancer, which is, as a rule, not severe. The pain is violent, constant, radiating to the ribs, and thence to the lumbar region, particularly to the last dorsal or first lumbar vertebrae. A second symptom is anorexia. Refusing nearly all food, the patients rapidly become emaciated and weak. The amount of vomited matter is rarely large, although the patients vomit very frequently."

He later states: "Little of value is to be learned from analysis of the gastric contents in these cases, as the chemical characteristics may be the same as in simple ulcer." The rapid and regular diminution or disappearance of hyperacidity at intervals is, according to those best versed in the subject, the most important sign to be derived from such examination. Hayem, who has done much work along this line, states that when hyperchlorhydria is superseded by achlorhydria, it is almost certain that cancer is developing.

Albu maintains that an early diagnosis of gastric cancer can oftentimes be made, if it can be shown that a slight, but progressive loss of weight is taking place. It may be so slight as to escape the notice of the patient and physician until finally it is so marked as to be apparent to all. He furthermore emphasizes the fact that this slight loss in weight continues in spite of extra nourishment taken between meals in the form of concentrated and easily digested foods. Therefore, he believes that, if the patient loses weight steadily, although enjoying his meals, seemingly digesting them, and, in addition, partaking of nourishing food between meals, a diagnosis of carcinoma is justifiable. This loss of weight, he says, occurs in carcinoma of the fundus as well as of the pylorus. The differentiation between these two forms, he believes, may be made by testing the functional activity of the stomach. In the beginning of carcinoma of the fundus there is little or no diminution in motility; free HCl is markedly decreased or absent. Thus, we have a picture of chronic atrophic gastritis. In carcinoma of the pylorus, on the other hand, there is very early seen a marked impairment of gastric motility and there is a steady decrease in the amount of HCl; in other words, we have pyloric stenosis plus a constant diminution in the HCl from month to month, perhaps from week to week. The subjective symptoms are so widely variant in different cases, and in the same case from time to time, that they are practically valueless.

The help obtained from the clinical laboratory has not kept pace, in our experience, with progress in other fields. The findings are so inconstant as to lead to confusion, were much reliance placed on them. Hyperacidity of course, is still looked for in both gastric and duodenal ulcers. It frequently is absent in gastric ulcers, however. It may be that this is due to the fact that gastric ulcers so frequently undergo malignant change. Hyperchlorhydria is the rule, however, in duodenal ulcer. The value of a single test meal examination has been shown to be little, and repeated examinations are exceedingly disagreeable and trying to the patient so that it is natural that we should not depend much on such findings for help. The more recent work of Hawk, Rehfuss and others promises better results. We have not as yet had enough experience with the fractional method of determining the acidity of the gastric contents to express an opinion as to its value. On the other hand, it would be difficult to overestimate the value of the x-ray in gastric diagnosis. It has given us such an exact method of determining these lesions that we are becoming somewhat lax in our efforts to arrive at a diagnosis by the history and physical signs alone. It is not within the province of this paper to discuss x-ray methods of diagnosis, since many papers by roentgenologists have placed first hand information at our disposal.

Carman, of the Mayo Clinic, states that of 47 cases of gastric ulcer coming to operation at the hands of the Mayos, 39, or 83%, had been diagnosed as such by radiologic signs. He states that the positive radiologic diagnosis of gastric ulcer can be based only upon the presence of one of two signs, namely, the niche or the accessory pocket; other signs which are corroborative but not diagnostic of themselves are (1) the incisura, (2) hour-glass stomach, (3) residue in the stomach after 6 hours, (4) lessened mobility, (5) localized pressure tender point (6) delayed opening of the pylorus, (7) acute fish-hook form of the stomach with displacement to the left and down, (8) gastric hypotonus, and (9) antiperistalsis. Carman describes the roentgenologic indications of duodenal ulcer also in two groups, major and minor signs. The major signs are: (1) gastric hyperperistalsis, (2) a residue in the stomach (sometimes in the duodenum) after six hours if there be obstruction from scar contraction, (3) a diverticulum of perforating ulcer. The minor signs are: (1) gastric hypermobility with early free opening of the pylorus and speedy clearance of the stomach, (2) gastric hypertonus, (3) irregularities in the outline of the cap or bulb or of the duodenum, (4) lagging of bismuth in the duodenum, (5) pressure tender point over the duodenum, (6) spasms of the stomach such as hour-glass or slowly travelling incisure. We are not so much concerned, however, with the detail of x-ray findings as most of us will have to leave their interpretation to the experts in this field of work.

The question of greatest interest when considering the pathology of gastric and duodenal ulcer is, how frequently do these ulcers become carcinomata? To dispose of the latter first: primary duodenal cancer is rare; we have been able to find only one hundred and eleven cases reported in the literature. Whether or not the chemical difference between the duodenal and gastric juices is responsible for this comparative immunity of the duodenum we cannot say, although it would seem a possible solution. Gastric ulcers, however, undergo malignant change with comparative frequency. Many investigators have amply testified to this fact. Cruvielhier, in 1839, was the first to call attention to this explanation of the origin of many gastric carcinomata, and since that time Deiterich (1848), Rokitansky, Futterer, Ssapeschko (1902), Stich (1903), Oettinger (1903), Jedlicka (1904), Wilson (1914), as well as others, have written on this subject. Estimates of the percentage of gastric carcinomata showing positive microscopic evidence of ulcer have varied from 26.6 (Jedlicka) to 90% (Ssapeschko). Wilson is of opinion that cancer rarely develops except on an ulcer base. The clinical observations of Mayo-Robson, who placed the percentage of cancers preceded by ulcer at 59.3, W. J. and C. H. Mayo at 71, and Moynihan at 72.1 support the observations of the pathologists. Therefore, in the face of all this evidence, we must assume that a fairly large per cent. of gastric ulcers do undergo malignant change. It is entirely reasonable to assume that this is so since we know that cancer developing elsewhere in the body is often preceded by inflammatory lesions, as, for instance, in the breast, lip, uterus, and prostate. It would seem that ulcers of the stomach situated elsewhere than at the pylorus do not undergo malignant change so frequently as those at the pyloric end. My father called attention to this fact as the result of clinical observation in 1900 and his opinion was confirmed later by the pathological work of Jedlicka.

In the light of this pathology, then, what is to be the operation of choice in dealing with gastric and duodenal ulcer? Again to dispose of the latter first, we can safely say that gastrojejunostomy in the hands of most operators has proven eminently satisfactory for duodenal ulcer. Furthermore, the accumulative experience of most surgeons is that it is unnecessary to do anything more than a posterior no-loop gastroenterostomy when dealing with duodenal ulcer since, after the operation has been correctly done, these ulcers heal, and, as I have said elsewhere, do not as a rule undergo malignant change. On the contrary, they usually heal promptly, and, as the anatomy of the first portion of the duodenum, where ulcers are usually situated, does not make it rational to carry out resection routinely, it is fortunate that gastroenterostomy suffices so well. Pyloroplasty, first developed by Heinike-Mikulitz and later much improved by Finney, also has a distinct place in dealing with duodenal ulcers. Finney and Friedenwald have published comparative statistics of two series of 100 cases each, one being treated by gastroenterostomy, the other by pyloroplasty, and in their hands somewhat better results were obtained by pyloroplasty. But I believe the majority of operators will continue to find that a simple posterior, no-loop gastroenterostomy will be the operation of choice in dealing with duodenal ulcer.

On the other hand, the very fact that there are so many ways of handling gastric ulcers is evidence enough that there is no one way that can be called the operation of choice. About ten years ago surgeons generally began to feel that gastroenterostomy alone was not the ideal operation for gastric ulcer. Earlier failures were attributed to errors in technic, but it soon became evident that these would not explain all the disappointments. The anterior operation had given place to the posterior, the long loop to the no-loop (a step which did away with most of the regurgitant vomiting), and all mechanical helps in making the anastomosis to direct suture. Some few of the more observant clinicians began to suspect—what Cannon later proved in the physiological laboratory—that the stomach did not take kindly to two functioning openings, so that when the pyloric ulcers healed and the pylorus began to function again as well as the artificial stoma, the physiology of gastric digestion became seriously interfered with and the old symptoms of gastric disturbance returned. Then many different ways were suggested for permanent pyloric exclusion, so that one could choose between Von Eiselberg's unilateral exclusion and various plication methods, ligature, etc., none of which answered the purpose for which it was intended, except Von Eiselberg's. The pylorus soon became patulous again after any of the others. We have never practised pyloric exclusion and it is our belief that those who have done so either already have abandoned the method or soon will do so. It has seemed to us more rational to excise the ulcer-bearing area at the pylorus than merely to divide the pylorus and close each end.

Peptic ulcer of the jejunum following gastroenterostomy is a troublesome sequela of this operation. Much has also been written on this subject. Van Roojen collected 89 cases from the literature, 79% of which were in males. The condition occurred at all ages and the vast majority followed gastroenterostomy for benign stenosis of the pylorus. It has been equally frequent following all types of gastroenterostomy. In a few instances the symptoms of ulcer developed almost immediately following operation. In others a long period of time intervened. The situation of the ulcer in over half of the cases was at or near the gastroenterostomy stoma.

The clinical course varied, since in some cases acute perforation occurred quickly, in others the symptoms ran a protracted course and resembled those of the original ulcer. Van Roojen feels that injury to the intestines at the time of the operation in the form of blunt trauma or from cutting instruments played a leading part in the etiology of this type of ulcer. He advises, therefore, extreme care so as not to injure the gut and that gastroenterostomy be followed by a prolonged period of ant-acid diet. In three cases of this series jejunal ulcer developed spontaneously; no operation having been previously done. Others have reported instances of jejunal ulcer following gastroenterostomy; thus Von Eiselberg saw 8 instances develop in a series of 600 gastroenterostomies.

Clairmont, Von Haberer and Boas, in writing upon this subject, have each attributed to hyperacidity a large share in the etiology of jejunal ulcer. Balfour and Carman report 13 cases of gastro-jejunal ulcer occurring at the Mayo Clinic. A study of these cases revealed the fact that no symptom or set of symptoms was pathognomonic. There was usually pain, very much the same in character as that before operation, although it was situated to the left of the mid-line and below the umbilicus. These authors think that this type of ulcer can nearly always be diagnosed by means of x-ray findings which may be divided into two classes:

a. Those indicative of secondary pathology,
  1. Retention of six hour meal.
  2. Large size of stomach.
  3. Exaggerated peristalsis.
  4. Lessened mobility of stomach and spasticity.

b. More direct signs pointing to the seat of the pathalogy.
  1. Deformity of contour about stoma.
  2. Deficient patency of stoma.
  3. Local irregularity of jejunal contour.
  4. Dilatation of the duodenum.

The pathology of these ulcers was fairly constant. In size, about 3 c. m., they actually involved the anastomosis with a tendency to spread to a greater extent on the jejunal than on the gastric side. There was induration of the entire line of the anastomosis, and adhesions to neighboring viscera were found. Subacute perforations of these ulcers was the rule and in one case a fistula formed between the stomach and colon. Strands of unabsorbable suture were found in 6 cases. There was no fixed plan of operative procedure in this series of cases. Wherever possible the ulcer was excised and the gastroenterostomy opening enlarged. If this was not possible the anastomosis was divided and a Finney pyloroplasty done.

The operation of Balfour, burning out the ulcer by means of the Paquelin cautery, is useful in handling ulcers of the lesser curvature and has proven a valuable addition to surgery of the stomach.

Finally, in making a plea for still further adoption of the principle of pylorectomy for ulcer, or excision of the ulcer-bearing area, I can do no better than to quote my father: "Is it not, therefore, true conservatism to take into consideration potential dangers, such as hemorrhage, perforation, subphrenic abscess, disabling adhesions, and greatest of all, cancerous implantation upon the base of the ulcer, and to anticipate and prevent all by a radical operation, instead of doing one which may at most prove palliative, and that for a time only? The only way to view this difficulty, it seems to me, is to ascertain if a radical operation, which removes the lesion, can be instituted with less risk to the patient than that which is inseparable from the disease itself. In chronic ulcers there would seem to be no difficulty in answering this question, as a conservative estimate of the mortality following medical treatment, and admitted by medical authorities, is not less than 25 per cent. If we separate excisions and pylorectomies we find that the former yield a mortality of 1.75 per cent. (171 operations, 3 deaths) which is less than that following gastroenterostomy. Two hundred and five pylorectomies were followed by 18 deaths, or 8.7 per cent. It must be remembered that these statistics include all operations reported during the past fifteen years and represent the experience of many surgeons, some of whom have done very few operations. In 376 radical operations performed by all of the surgeons communicated with, the mortality was 5.6 per cent. or less than that from hemorrhage alone, and one-half that following perforation—not to mention the additional risks of subphrenic abscess, disabling adhesions resulting in hour-glass stomach, and that indefinite, intangible, but ever-increasing danger, malignant degeneration of the ulcer. So frequent is the last-mentioned complication that it would seem now the duty of the surgeon to remove the lesion when it is practicable and does not entail too great operative risk, for a considerable majority of those communicated with have expressed themselves most positively upon this point." We do not claim that it is possible, in every case, to remove the ulcer-bearing area safely; at times adhesions to neighboring viscera, as the gall-bladder, colon, pancreas, make it impossible to mobilize the pylorus. Then we must be satisfied with gastroenterostomy. But where it is possible, why not rid the patient of a disease which threatens his life by hemorrhage, perforation or malignant degeneration even after gastroenterostomy has been done? Many have expressed themselves as in favor of the principle since it was first introduced in 1900. Such men as the Mayos, Mayo-Robson, Brewer, Gerster, Coffey, and many others have found it to be sound surgery. Certainly, in our own experience it has been most satisfactory and has added but little to the operative risk. There is still a 5 per cent. mortality from gastroenterostomy as an average from a number of the leading surgeons of America quoted above. The same men place the mortality from pylorectomy for ulcer at 8 per cent. The difference is too small to consider, in face of the fact that it is, in all probability, more than made up by deaths from hemorrhage, perforation and malignant degeneration following gastroenterostomy alone.

DISCUSSION.

DR. FRANKLIN W. WHITE: I have listened with a great deal of interest to the remarks of our distinguished guest.

It sometimes appears as if there were real differences of opinion between physicians and surgeons about the treatment of ulcer. These differences are not real. They are due almost entirely to the difference in the material seen. The earlier and simpler cases come to the physician; the later, more severe and more complex cases are selected for the surgeon to see.

The patients usually consult the physician first. Most of these are early cases; some late. Some should go straight to the surgeon; some need medical treatment. How shall we decide this? I shall mention only a few points. First we ask, Where is the ulcer—in the stomach or in the duodenum? This is important. The ulcer of the duodenum very rarely becomes malignant; the ulcer of the stomach changes to cancer more readily. We need not waste time trying to decide where the ulcer is by the symptoms. We can look and see where it is by the x-ray.

Second: What is the size of the ulcer? This is also important. Dr. McCarthy of the Mayo Clinic has found that ulcers excised from the stomach, whose crater was as large as a twenty-five cent piece, usually showed malignant change. The big ulcer should go to the surgeon; the smaller ones should have medical treatment first as a rule, even if they are in the stomach.

There has been a revolution in the methods of diagnosis of ulcer in the last few years. Take palpation. How little we can feel in comparison with what we can see with the x-ray! Tests with the stomach tube have taken their proper place, formerly considered very important, now always useful, but secondary. Tests for blood should be used not to diagnose ulcer, but to show how active it is, and help to rule out cancer by negative tests.

This is no time to speak of the medical treatment of ulcer in detail, but if the physician is to do his part, he must treat them early and thoroughly. The keynote to medical treatment should be the prevention of chronic ulcer. If we cannot prevent chronic ulcer we are likely to need a surgeon. The best way to heal an early ulcer is to be sure that the stomach empties promptly and remove the acid by the use of considerable alkali and sufficient food. A gastroenterostomy is effective just so far as it does both these things.

Thorough systematic medical treatment gives excellent results in the early cases. Dr. Sippy of Chicago has shown that moderate obstruction of the pylorus is no contraindication to medical treatment: actual permanent tissue narrowing occurs only in one in twelve or fifteen cases of pyloric obstruction. Edema and infiltration disappear with the healing of the ulcer. In duodenal ulcer, just as in diabetes, medical treatment must be systematic and thorough and prolonged. Both doctor and patient must "play the game." This is the only way to get good results in either of these diseases.

With regard to the "ulcer-cancer" question, the development of cancer upon a previous ulcer, we must remember that all our present data begin at the cancer end and shows what per cent. of excised cancers gave evidence of a previous ulcer. This has nothing to do with the per cent. of ulcers which become cancerous. For these figures we must start at the ulcer end. These data are very difficult to get and is a thing for the future. Most physicians believe that a rather small per cent. of ulcers, even of the stomach, become cancerous.

To summarize: all duodenal ulcers, except those which are perforated or bleed badly, or cause very marked obstruction, should have medical treatment first; small gastric ulcers the same; medium and large gastric ulcers should go at once to the surgeon on account of the danger of cancer. Thus the physician's part consists in giving the earlier cases thorough systematic treatment to prevent chronic ulcer if possible, also in sending all proper cases at once to the surgeon. In this way both the physician and surgeon work hand in hand for the best welfare of their patients.

Dr. J. T. Bottomley: I agree entirely with the views of Dr. Rodman on the treatment of gastric ulcer. I belive that the ulcer should always be removed when possible, and that a gastrojejunostomy should always follow a resection entirely independent of the location of the ulcer and the manner of its removal.

I am not, however, in complete agreement with Dr. Rodman in his views of the treatment of duodenal ulcer. I do not believe that the pylorus should be resected in every case. In my experience it is only very rarely that hemorrhage from a duodenal ulcer occurs subsequent to gastro-jejunostomy and we know that simple gastro-jejunostomy gives an entirely satisfactory result in about 90% of our cases. These are sufficiently favorable statistics to justify our taking, for the present at least, the position that the added risk of resection is, as a rule, unwarranted.

One more point I should like to emphasize. The recent work of Rosenow has called our attention to the possibility that certain septic foci (as, for instance, in the teeth, the tonsils, the appendix, etc.) may have a causal relationship to gastric and duodenal ulcer. This fact should be kept in mind and such foci should be sought for and, if found, should be eliminated.

Then, too, the post-operative dietetic and drug treatment in ulcer cases is important. When we excise an ulcer, we remove only the end stage of a pathological process. Causal conditions and circumstances probably remain the same and must be combated by diet, drugs and improved habits. The internist must be brought into the campaign.

Dr. F. B. Lund: In these cases we are confronted by the important question: Shall we resect (Rodman) or do a simple gastroenterostomy? Resection in this sense means resection of the pylorus with the growth, closure of the duodenum and stomach ends, and posterior gastroenterostomy. These ulcers are the most interesting of all, because we cannot always tell whether they are benign or malignant. Early cancers are harder, have little white fibrous dots in the scar tissue close about them, and the involved glands are usually tender. Ulcers have a lot of induration about them, spreading down the duodenum and up into the pyloric antrum. The scar is yellowish often, and there are often fresh, slightly inflammatory adhesions to the pancreas; that is, in the typical cases.

It may be said that the more inflammation and spreading oedema (which means that the tumor shades off gradually without sharp edges) these cases have, the worse they may look, but the less likely will they be to be cancer. If this oedema extends down into the pancreas, excision will be difficult and attended often by hemorrhage from the small vessels about the head of the pancreas. When things look this way, a wise man does not excise, but does a gastroenterostomy. The patient rapidly recovers, and two weeks later the surgeon, if in any doubt, may re-operate, and when he does will often find the tumor has entirely disappeared, so an incision would have been an unnecessary risk. If the tumor is the same, or has increased, the surgeon may now resect, which is a comparatively simple operation when the gastroenterostomy is already performed. Lilienthal and others, in fact, advocate the two-stage operation in most cases of cancer. The objections to two-stage operations in cancer are: that sometimes after the gastroenterostomy is done, the growth may extend so close to its opening as to make an adequate resection at the second operation impossible; and that adhesions from the first operation may sometimes cause trouble for the second operation. In definite cases of cancer, it is only to be considered in cases where it is thought the patient would not stand the operation in a single stage. An excellent rule in doubtful cases, when one cannot tell whether the tumor is benign or malignant, is to excise always when the tumor is movable and not tied up so as to make excision risky. In clear cases of ulcer, don't excise; it is unnecessary. In clear cases of cancer, excise as a matter of course; it is the only hope of cure, nay, even of relief.

In regard to microscopic examination of a portion of the growth excised in order to determine whether to perform gastroenterostomy or excision, it seems to me that it gives us practically no assistance in these cases, for if we are going to excise at all, we excise well outside of the indurated area, and we operate between clamps without opening the removed portion of the stomach and exposing the operative area to infection. If we excise a piece of the ulcer for examination, we have to open the lumen and expose the patient at once to the danger of infection, and possibly deal with a bothersome hemorrhage. By the time the pathologist has his frozen sections cut and reported, we ought to have the stomach practically sutured.

Again, in cutting out a piece of growth for examination in case we are dealing with an ulcer which is malignant only at certain portions, we may not get one of the cancerous portions, and be deceived by the pathologist's report.

For these reasons, it seems to me that pathological examination of frozen sections at operation is of little value in deciding as to malignancy.

Dr. A. W. George: The diagnosis by the Roentgen method, of chronic ulcer of the duodenum, offers very little, if any, difficulty. The Roentgen observations are as definite and precise as the common lesions of the long bones. This has been brought about by careful plate work. Fluoroscopic examination has offered very little help towards direct diagnosis. In fact, the reverse is true.

The differential diagnosis of chronic ulcer from adhesions involving the duodenum is more difficult. With chronic ulcer of the duodenum, after administering the bismuth meal and when the stomach begins to empty, the filling defect due to ulcer becomes more apparent. Conversely, with adhesions alone, as the stomach empties, the defect becomes less apparent. As a matter of fact, from a real practical point of view, if we pass the opinion that there is a pathological lesion of the duodenum, we have accomplished much.

The typical ulcer deformity in the first portion of the duodenum is practically due entirely to the connective tissue formation about the ulcer. It varies in all cases as will the size of the mucosal defect. In a series of 160 operative cases, no ulcer of the second portion of the duodenum was found with the exception of one case.

As long as we use the plate technic the diagnosis of chronic ulcer of the duodenum is practically 100 per cent. Errors arise from faulty technic and occasionally in the differentiation between chronic ulcer and adhesions. Of all the surgical lesions of the gastro-intestinal tract, that of chronic ulcer of the duodenum is by far the simplest to diagnose.

Dr. E. A. Codman: I agree with Dr. Rodman's opinions about gastric ulcer, but not duodenal ulcer. It is hardly worth the extra risk to do a pylorectomy in those cases.

Dr. D. F. Jones: I agree with all that Dr. Rodman has said in regard to excision of gastric ulcer. If I understood Dr. Rodman correctly, he said he believed in excision of duodenal ulcer also, because a considerable percentage perforated, or bled after gastroenterostomy. I cannot give the statistics for such complications in this community, but I feel certain that such occurrences must be very small, much smaller than the number which would die from the increased danger of the operation of excision in all cases over that of gastroenterostomy.

Dr. Walter Dodd: There has been so much and such favorable reference made to the value of the Roentgen ray in gastric diagnosis, this evening, that I hesitate to attempt to add anything to what has already been said.

Dr. Rodman has called attention to the importance of early diagnosis in gastric cancer, and to the fact that very few cases are discovered early enough to be cured by surgery.

I believe that this point is a very important one and that with our present methods of examination we should be able to make such diagnosis.

During the year 1914 we examined at the Massachusetts General Hospital 730 gastric cases by means of the bismuth meal; of these cases, 75 were diagnosed as duodenal ulcer, 47 as gastric ulcer, and 97 as gastric cancer, leaving 511 in which no lesion was found in the stomach. It is now nearly a year since the last of these examinations were made. I have attempted to follow these negative cases, several of them have been re-examined, and in so far as I am able to learn, only one has since shown evidence of gastric cancer. Nevertheless, the statement is true,—we are finding very few operable gastric cancers. It does not seem that we can be missing them. These patients do not have sufficient symptoms in my opinion, to make them seek help until the lesion has become inoperable, and it would seem that what is most needed is some such method of education as has been carried out in the treatment of phthisis.

The criticism usually made by the general medical profession of the Roentgen method in gastric examinations of the stomach is not that it is inaccurate, but that it is too exclusive to be applied as a routine procedure.

The fluoroscopic method of examination offers a means of eliminating this criticism and has made possible the general use of the Roentgen examinations even in free hospital clinics.

During the past two years we have examined about 150 cases upon whom gastroenterostomy had been performed; in practically all of these cases where the pylorus was not closed at operation, the stomach contents were seen to leave by it as well as by the gastroenterostomy opening.

From these findings one might conclude that it is advisable to close the pylorus, in case of duodenal ulcer, at least.

Dr. Rodman (closing): I would say that I am very much indebted to the members for the full, fair, and generous discussion of the subject. I am absolutely in accord with Dr. White. I wish to say that all acute ulcers are strictly medical and should be so considered. Some of the mild chronic ulcers should be treated for a time and if they fail to respond, I believe they should be turned over to the surgeon.

I wish only to express again my indebtedness to the Roentgenologist for making this work easier. I believe that with the aid of the x-ray we can very nearly determine in advance what is the procedure of choice.

I again wish to thank you.

Address.

THE PRACTISING PHYSICIAN AND THE PUBLIC HEALTH.*

By Merrill E. Champion, M.D., C.P.H., Wollaston, Mass.

State District Health Officer.

Appreciation of the need of measures directed towards the preservation of the public health may be traced back to very early times. That first great sanitarian, Moses, established a code of public health laws some of which have not been thoroughly put into practice even yet. Sewage disposal, while not the problem it is in this day of large cities and towns, nevertheless merited, and received, attention. Thus we read that the Children of Israel were commanded:

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* Read before the Norfolk South Medical Society, Feb. 1, 1917.

> "Thou shalt have a place also without the camp whither thou shalt go forth abroad; and thou shalt have a paddle upon thy weapon; and it shall be, when thou wilt ease thyself, abroad, thou shalt dig therewith, and shalt turn back and cover that which cometh from thee."

If the people of the warm countries and of our own South were to obey this injunction today, a very large part of the suffering and economic loss entailed by the prevalence of hookworm disease would be obviated.

It will be noted, however, that in those early days the sanitarians were not physicians but priests or lawyers, and as we glance down through the centuries since then, we find that the physicians who rose to eminence did so because they made great discoveries in anatomy or physiology, or because they were skillful surgeons, rather than because they originated and enforced wise provisions for the prevention of disease in the many.

One reason for this was that the true cause of our worst plagues was not even guessed at. If the cholera or the bubonic plague were inflicted upon men for their sins, then the only rational prevention was to pay closer attention to the rules of the church. If malaria came from breathing the night air, the proper thing to do was to sleep with the windows closed.

The development of the microscope and the advent of the germ theory of disease changed the face of things materially, though the new ideas were slow in gaining a foothold; and indeed they have not yet penetrated the minds of certain physicians who are yearly much in evidence before legislative committees; physicians who deny the benefits of vaccination, of diphtheria antitoxin and other such obvious things. It began to dawn upon people that disease could be prevented as well as cured. It began to be realized that disease is the result of ignorance and carelessness rather than of sin, and implies not an angry God but an ignorant man. Upon this foundation began to be reared a system of preventive medicine. Comparatively early, however, certain far-seeing men grasped the principles of prevention in a way which now, in retrospect, seems marvelous. These men were not physicians. In 1849 the Massachusetts Legislature appointed a commission to study the question of public health and to bring in recommendations. This commission, often called the "Shattuck Commission," after Lemuel Shattuck, one of its members, brought in a report which stands out as a great human document and is worthy of the careful study of every citizen of the Commonwealth. Various recommendations were set forth in their report, some of which, although sound in every way, have not been put in force to the present day. Two of the most important recommendations made were those to establish a state board of health and local boards of health; it was twenty years later before a state board of health was established. I venture to quote the wording of the preface of their report: "We believe that the conditions of perfect health, either public or personal, are seldom or never attained, though attainable; that the average length of human life may be very much extended, and its physical power greatly augmented; that in every year, within the Commonwealth, thousands of lives are lost which might have been saved; that tens of thousands of cases of sickness occur, which might have been prevented; that a vast amount of unnecessarily impaired health and physical debility exists among those not actually confined by sickness; that these preventable evils require an enormous expenditure and loss of money, and impose upon the people unnumbered and immeasurable calamities, pecuniary, social, physical, mental and moral, which might be avoided; that means exist, within our reach, for their mitigation or removal; and that measures for prevention will effect infinitely more than remedies for the cure of disease."

With this hastily sketched background, let us consider the place of the practising physician in the scheme of public health protection. For all practical purposes, we have four factors to deal with: the people, their private physicians, the local board of health, and the State Department of Health. Or, arranged a little differently, the family physician and his clientele; the local board of health and the people and physicians of the town; the State Department of Health and the different boards of health, physicians and people of the State.

Let us briefly outline the part the various factors should play. The public—the most important part of all, naturally—determine who shall be their physicians, their boards of health and ultimately their State Department of Health. The local boards of health are entrusted by the people with the power to make and enforce reasonable regulations for the protection of the public health, and these regulations are binding on laymen and physicians alike. The State Department of Health plays the rôle of expert adviser. It accomplishes its results, as a rule, by persuasion and argument, rather than through coercion.

The practising physician, however, is at present the all-important factor in the protection of the public health. All the others have to rely on him for a great measure of their results. How has he met this responsibility?

On the whole, I fear the answer to this question must be made that he has not risen to the full measure of his opportunities. The physician is, by training, an individualist and something of an autocrat. He thinks in terms of family rather than of community. His dictum on medical matters is accepted as final by many of his patients and, of course, listened to with respect by all. The many details of private practice tend to concentrate his attention on the cure of the ailments of his own clientele, and he takes it for granted that his brother practitioner is doing the same for his clientele. This attitude too often results in a certain narrowness of outlook; the foreground is so sharply defined that the background is lost sight of. It means a vast number of units working independently of each other and with very little correlation.

For the time being, the interests of the patient—that is, of the man who is paying him—are all important in his eyes. He is apt to forget that his doctor neighbor's patient, in the larger point of view, is of equal importance. This attitude of mind makes it possible for tremendous pressure to be brought to bear under certain circumstances, as, for instance, in the matter of release from quarantine. I have known a physician to yield many times to such pressure and to certify that his patient was ready to be released from quarantine when his best judgment could not approve such a step.

Let us see if we can define clearly what should be the relative duties of physicians and boards of health in this matter of public protection. In the first place, the law lays upon the boards of health the duty of making regulations and enforcing such regulations for the protection of the public. This includes control of quarantine and isolation in all cases of communicable disease. The treatment of the individual case has to do entirely with the family physician. The control of quarantine and isolation and its termination has, one might say, really nothing to do with the family physician. These matters are the functions of the board of health. Right here I will say, however, that the board of health is dependent in the greatest possible measure upon the hearty coöperation of the family physician. Unfortunately, in many cases, either because of feelings of professional jealousy or differences of various kinds, the family physician supports in a lukewarm manner, or perhaps even directly opposes, the board of health. The family, in turn, is quick to know this and rebels against all restrictions. The result is bound to be unfortunate for the public at large. Adequate isolation and quarantine are not enforced and foci of disease are established, to stamp out which may take much time and money, and which may even result in the loss of valuable lives. Examples of this are easy to find. One instance may be mentioned where a grown man was suffering from an eruptive disease. He was seen by his physician on the street; the physician made an off-hand diagnosis of chicken-pox and did not even report it. The sequel of it all was an epidemic of smallpox. Another physician had a case of discharging eyes in a small baby. It did not look like gonorrhea to him so he asked to be notified by the family if the eyes did not clear up under the treatment he had ordered. He did not report the case, regardless of the fact that the law says that *all* reddened, swollen or discharging eyes shall be reported, whether of gonorrheal origin or not. The next heard of the case was that the baby's eyesight was seriously impaired. Instances such as these in the case of other diseases could be multiplied *ad infinitum*, and constitute a serious breach of trust with the individual patient and with the public.

In what way can the local board of health and the State Department of Health help the practising physician in his fight against disease and in his attempts to protect the public health? Many ways come to mind at once. The local board of health, by the authority conferred upon it by law, can render much easier the task of the family physician in maintaining proper control over communicable diseases. The local board of health can render it possible for him to get his patients, rich or poor, into the proper communicable disease hospitals. It should also be able to furnish him with invaluable information regarding the prevalence of disease in the community. In many instances it does furnish him with laboratory service for the diagnosis of communicable diseases.

The State Department of Health, on the other hand, can likewise furnish him with much assistance. It is the duty of the state to furnish expert advice on all matters which have to do with the life and health of the citizens of the Commonwealth. Its sailing orders, in the words of the law, state that:

> "Said board shall take cognizance of the interests of health and life among the citizens of the Commonwealth, make sanitary investigations and inquiries relative to the causes of disease, and especially of epidemics, the sources of mortality and the effects of localities, employments, conditions and circumstances on the public health, and relative to the sale of drugs and food and the adulterations thereof; and shall gather such information relative thereto as it considers proper for diffusion among the people. It shall advise the government relative to the location and other sanitary conditions of any public institution; and shall have oversight of inland waters, sources of water supply and vaccine institutions, and may, for the use of the people of the Commonwealth, produce and distribute antitoxin and vaccine lymph and such specific material for protective inoculation against typhoid fever and other diseases as said board may, from time to time, deem it advisable to produce and distribute. It shall annually examine all main outlets of sewers and drainage of cities and towns of the Commonwealth, and the effect of sewage disposal, and shall annually report thereon to the general court, with such recommendations for the protection of the interests of persons and property and for the prevention of offensive odors and objectionable conditions as it considers expedient."

This Department will inform him concerning the occurrence of disease throughout the State. It will give him information regarding the State's health laws. It will furnish him with diagnostic assistance in communicable diseases at no cost to himself or to his patient, and with laboratory assistance, such as examinations for diphtheria, typhoid fever, malaria, etc. It will do for him free Wassermann tests for syphilis. Moreover, the State offers the physician various agents used in the prevention and treatment of certain communicable diseases: diphtheria antitoxin, serum for the treatment of cerebrospinal meningitis, typhoid vaccine, smallpox vaccine. All these things are free to any reputable practising physician.

What does the State ask in return for these things which she furnishes to her citizens free? In the first place, she asks that the physicians report promptly all cases of communicable diseases, births and deaths within their knowledge. She asks these things, but she does not always get them. Physicians are often very careless about reporting births, sore eyes in babies, and communicable diseases in older children or adults, yet the health authorities of both town and State are powerless to control disease, the existence of which they are unable to ascertain. They are powerless to estimate the infant mortality if they do not know how many babies are born. They cannot tell whether or no an epidemic is threatening from a given milk supply if the practising physician in charge of each individual case of disease is careless about reporting the milk supply of each of his cases of communicable diseases. I recently looked over 120 reports from physicians in one city, and from that number only 26 gave the name of the milkman supplying milk to the infected families, although the space for such a report was clearly indicated on the card.

Tuberculosis is a poorly reported disease, although it is of the utmost importance. Physicians, seeing a case of the latter disease, frequently take it for granted that it has been already reported because it has been seen previously by some other physician. The law does not contemplate taking anything for granted. Better that a case be reported four times than that it be not reported at all. The State Department of Health has a system whereby cases reported more than once are not counted more than once, so that multiple reports do not vitiate our statistics.

Finally, the State has a right to ask that the physicians be the first to support all matters which tend to promote the health and happiness of the citizens of the Commonwealth. How can this best be done? The physician should be the adviser of his families, not merely in times of sickness, but in times of health. He should give more thought to the prevention of ailments, while not relaxing in any way his endeavors towards cure when ailments do appear. This may sound Utopian, but as a matter of fact it is not so. We all know in what a state of flux the public mind is at present in medical matters. Many people are becoming distrustful of the old measures of treatment, and they are taking more interest in prophylaxis. They read in the newspapers articles on the cause and prevention of disease—information they too often do not get from their family physician. The old type of family practitioner is said to be gradually disappearing, and it is greatly the fault of the medical profession itself. On the other hand, I listened not long ago to a paper by a Boston physician in which he described an experiment which he has been carrying on for a year with some fifty families. They consider him their family physician, and call him when they get sick, but he feels disappointed if they have to call him often for that reason. His great work lies in the direction of prevention. He makes careful examination of his patients while they are well, visits them while they are well, and does his best to keep them well. I feel strongly that this is the inevitable outcome of the changes taking place at the present time. Only in this way will the physician be able to cope with conditions arising from the newer forms of social thought, such as health insurance, for example.

To sum up the gist of our subject, the family physician should be the strongest ally which the board of health has. He should work hand in hand with the board, should see that the best representatives of the profession get on the board of health, and that they get adequate compensation for this work. He should work for the appointment of trained, full-time health officers in the cities and towns; he should work for the employment of public health nurses; for an adequate water supply, sewer system, and milk inspection. He should realize that his greatest function is to be the adviser of his families in *all* things which pertain to their physical and mental welfare. He should learn to think in terms of community as well as in terms of family.

Clinical Department.

REPORT OF A CASE OF CONGENITAL ANOMALY OF THE LARYNX.*

By George H. Powers, M.D., Boston.

Stenoses of the larynx and upper trachea from congenital anomalies are quite rarely seen, although of frequent occurrence as a result of contracting cicatrices following destructive inflammatory processes commonly seen in diphtheria, syphilis and tuberculosis. The congenital stenosis is usually found to be a web of fibrous tissue situated between and adherent to the vocal cords, such opening as is present being at the posterior commissure. Diagnosis by means of the laryngoscopic mirror is, under ordinary conditions, a simple matter, but if impracticable, as in an infant, direct examination under anesthesia should be conclusive. The literature upon this subject, beyond the fact that there are found in this region anomalous membranous diaphragms, is rather scanty. Treatment consists in two methods, operative and by slow dilatation. Of the former, two routes are open,—the intralaryngeal attempt to cut away the obstruction following with dilatation, and externally opening the larynx in the median line for the complete removal of the superfluous tissue. The latter method is a last resort on account of the probable permanent impairment of the voice. A great variety of dilating instruments has been described, both for intra-laryngeal use from above and for intra-tracheal use from below through a tracheal opening. Several forms of the latter are constructed for attachment to the tracheotomy tube, the dilator projecting upward through the trachea and even through the larynx, according to the site of the lesion. The case here reported presented some very peculiar, and to me, unusual, features:

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* Read at meeting of Boston Obstetrical Society, Feb. 27, 1917.

Immediately after birth the infant had no apparent respiratory difficulty, although a peculiar inspiratory sound similar to the cooing of a dove, was noticed. Labored breathing was not observed until some twelve hours later. Dr. Richard M. Smith was called in consultation on the next day, and after a thorough examination a persistent thymus was most seriously considered. A subsequent roentgen examination of the chest was negative in this respect.

On Tuesday, June 27, when the infant was about 36 hours old, the respiratory difficulty became very alarming; the breathing became progressively more labored, and the respirations more shallow, until the baby was utterly exhausted and cyanotic. Throughout the previous 24 hours, during periods of crying, respirations were much deeper and the cooing sound much more pronounced. At the time of the writer's first examination the baby's physical condition seemed desperate; the pulse was racing at 180, at times being almost uncountable; respirations were shallow, labored, and from 60 to 80 per minute; marked cyanosis was present. Any laryngeal examination or procedure was considered out of the question, and tracheotomy under slight ether anesthesia was at once done. Unfamiliarity with the soft trachea, as yet practically without cartilaginous development, of an infant but little over 36 hours old, added considerable difficulty to this simple operation, the trachea being so soft that great difficulty was found in holding it with sufficient firmness to permit of an incision. Immediately upon insertion of the tube, however, the breathing became deeper and the cyanosis gradually lessened. For the succeeding four days respirations were at times very irregular, varying from 40 and upwards to Cheyne-Stokes; this may have been due in part to exhaustion and insufficient oxygen. No further attempt at diagnosis was considered practicable until such time as the patient's condition would permit of surgical procedure. The subsequent tracheotomy history of the baby was uneventful, as evidenced by the weight table.

After a weekly gain for several weeks of 6-7 ounces, on Oct. 10 the baby, then some 3 1/2 months old, was etherized and the larynx inspected by direct examination, but with some difficulty on account of a great quantity of mucus and a very soft, flabby epiglottis. No abnormality was found above the vocal cords, which were normal in appearance, closure and excursion; but below the glottis no tracheal lumen was seen, there being visible just below the cords what appeared to be a flat diaphragm of normal mucosa corresponding in color with the false cords. A long pair of round-pointed nasal dressing forceps was now introduced through the larynx, pressing gently into this membrane, and gradually opened in line with the slit of the glottis to about 1/3 inch and the process repeated at a right angle. Considerable bleeding interfered seriously with further examination, but great improvement in breathing was noticed, which obtained for 20 minutes before the tracheal tube was replaced, during which time the wound was kept closed. Respiration now appeared normal, except for the presence of mucus and blood in the trachea and larynx, which fact was taken as definite proof that the obstruction consisted solely in this thin membranous diaphragm.

The tracheotomy tube was now replaced, and it was decided, if possible, to introduce, at the occasions of removal of the tube for cleansing, a pair of thin curved forceps upwards through the tracheal opening to the site of the obstruction, for the purpose of stretching the membrane as before. This was done at intervals of 2-3 days, by Dr. Charles O. Day, the family physician, for nearly three weeks, each dilatation causing a slight bleeding, but no more apparent discomfort to the patient than removal and replacement of the tube. During the absence of the tube on these occasions, great improvement in breathing through the normal channel was noticed. After the last dilatation on Oct. 29, the tracheal tube was not replaced for a half hour, during which time the little patient appeared quite happy, breathing deeply and with perfect freedom. Two days later the tube was permanently omitted, and a dressing applied over the tracheotomy wound. Respiration was apparently perfectly sufficient and normal, excepting the slight sounds caused by mucus in the trachea, to control which minute doses of atropine for about a week's time were necessary.

During this last visit the webbing together of the second and third toes of both feet was brought to my attention. This had so far escaped notice, and the discovery brought out the fact that this condition has been more or less common in the maternal family tree. The incident of the webbed toes was very interesting, for at the time of the tracheotomy, upon being pressed for a possible explanation of the obstruction, my guess was a web across the larynx or trachea, which I likened to the not uncommon condition of webbed toes. My remark, however, at this time of excitement, brought forth no recollection of this family trait.

Medical Progress.

TWELFTH REPORT OF PROGRESS IN ORTHOPAEDIC SURGERY.

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TUBERCULOSIS.

WHITBECK,[1] in reporting the work for ten years at the Sea Breeze Hospital, calls attention to the fact that this is practically the only institution in America where the treatment of surgical tuberculosis can be continuously carried out for any length of time. Since 1904, 262 cases have been treated at this hospital with the most satisfactory results. They have been able to discharge a great percentage of cases cured, and also many of the cases discharged improved have shown continued improvement afterwards. The orthopaedic treatment has been conservative, and the hygienic treatment radical. They have had every advantage of fresh air, salt water, and sunshine. Heliotherapy, they feel, has been a great advantage.

(Ed. Note.—The good work done there emphasizes the need of other institutions of a similar nature.)

Campbell[2] reports 16 cases of tubercular bone and joint affections in which general heliotherapy has been carried out with much consideration of detail, and in a fairly thorough manner; in fact, he has probably carried out general heliotherapy as well as the conditions permitted. His results have been very satisfactory, and his conclusions agree with those of most other observers in regard to the hastening of the expulsion of sequestra and the early beneficial effects in severe septic conditions, with a rapid healing of the sinuses. He believes that a cure is obtained in a much shorter time by this method. He has tried as much as possible to give up all encumbering apparatus, and has used only a frame or light movable splint, which has allowed a thorough application of heliotherapy.

(Ed. Note.—Each new series of cases carefully treated by this method helps to show its value as an adjunct in the treatment of surgical tuberculosis.)

That thorough orthopaedic treatment of tuberculous deformities of the hip and spine will give very satisfactory results is demonstrated by the work of Gauvain.[3] The necessity of a long-continued treatment is shown. He had every advantage of time and of hygiene in his work. Forcible correction was resorted to in certain selected cases, and of course this is justifiable only where the duration of treatment is limited only by the needs of the case and where the hygienic conditions surrounding the patient are excellent. The results in all his cases seem satisfactory.

The changed character of the lesions in certain cases in which, following characteristic tuberculous disease of the bone at an early age, there has been an absence of symptoms for five or ten years and then a recurrence of pain, is shown by Horwitz's[4] study of three cases. In these cases, after an absence of symptoms for five to ten years, pain associated with activity of the joint began to recur. Joint motions became limited, and there was slight tenderness and some referred pain. The x-ray showed old necrotic bone and some new bone formation. Horwitz advises treatment by manipulation and massage, *i.e.,* quite the opposite of that he recommends in an earlier stage of the disease.

(Ed. Note.—It seems to the editors that a very careful study of these cases must be made before such treatment as that advised would be justifiable.)

The studies of Paus[5] reaffirm the necessity of considering tuberculosis as always more than a local affection. In fifty cases with bone or joint tuberculosis, he found by animal inoculation tubercle bacilli in the blood. Multiple foci were very common, especially in the skin, various bones or joints, tendon sheaths, bronchial or other glands, intestines and meninges, and air passages. He considers that a focus once established can never be considered cured unless it is removed, and Silfverskiold[6] brings up once more the question of extirpation of a focus in tuberculosis of bone in the early stage. He believes that by opening into the focus and tamponing it with gauze impregnated with some irritating substance, as camphor-naphthol, the tissues will be stimulated to defend themselves against the infection.

(Ed. Note.—This or similar methods have been advocated from time to time, but for the most part have been abandoned after further study by the very men who originally advocated them.)

ARTHRITIS.

The necessity of searching for the focus of infection in cases of arthritis is pointed out once more by McCrae.[7] His suggestion, that other non-arthritic foci than the original one may cause a continuance of the arthritis, is of value.

RICKETS, ACROMEGALY, ETC.

Schloss,[8] who is making an extensive series of experiments on 14 infants, has come to the conclusion that there is no benefit from the addition of straight phosphorus to the cod liver oil, hence he has dropped the phosphorus from the treatment of rachitis. Neither calcium alone, nor cod liver oil alone, displayed any special efficacy, but the combination of the two with breast milk gave the most favorable results, both during the treatment and after its suspension. The calcium, in the form of decalcium phosphate or tricalcium phosphate, seems to give the maximum effect.

The report by Kahlmeter[9] of the case of a man of 45, who died from adenoma of the pituitary body, of ten years' duration, but who had no evidence of acromegaly, indicates that not all tumors of the pituitary body cause acromegaly.

(Ed. Note.—The article does not state, and one may well suppose that the tumor did not involve the part of the pituitary body concerned with the development of acromegaly.)

Wegelin,[10] in Berne, where almost all children are born with some goitre, in studying the cadavers of children still-born or dying soon after birth, has found some abnormal ossification, as, for instance, an absence of the center of ossification at the lower end of the femur. He believes that this abnormal process is due to abnormal functionating of the thyroid, and believes that, at least where goitre is endemic, thyroid treatment is advisable for disturbances of ossification.

FRACTURES.

Bandit,[11] in a very careful article on fractures of the astragalus, reviews the literature and discusses the x-ray appearances. Direct violence is regarded as the cause of the fracture. The author describes the mechanics of the fracture and makes a careful differentiation of the symptoms in cases of fracture of the neck and of the body, with and without displacement. In diagnosing he lays particular stress upon the varus position of the foot. The cases may be treated by: (1) simple reduction; (2) reduction by the open method; (3) reduction by reposition of the fragments; (4) astragalectomy. Wherever possible, after x-ray examination, he prefers the first method, although the other methods have their place in certain cases.

(Ed. Note.—In fractures of the astragalus, the astragalo-calcaneo articulation is very commonly involved, and its functions seriously impaired. As the flexibility of the foot depends upon the normal functioning of this joint more than any other, the maintaining of the proper weight-bearing line in fractures becomes of supreme importance.)

Brickner[12] gives as his method of securing full abduction and extension of the shoulder in cases of fracture of the greater tuberosity of the humerus, the fixation of the hand of the patient to the head of the bed, and the placing of the patient on a reclining rest or pillows, so that he may gradually slide down or the arm may be slowly pulled up. This seems, in his hands, to be a very satisfactory method, judged by the results, but it necessitates remaining in bed in one position.

(Ed. Note.—We have found that plaster casts or some form of splint holding the shoulder in abduction, may be made to fit properly without being very cumbersome, and think that this method offers a more sure and satisfactory way to treat these cases.)

In the treatment of irreducible joint fractures Robinson[13] shows how, by a simple procedure of fixing the bones by driving in an ordinary wire nail, the intractable fragments can be held in place. In an emergency where bone plates are not available, one must then resort to this method; also, the cases reported show results which suggest that it may be true that there are certain types of fracture near the joint on which it is difficult to use plates, and also not advisable on account of the interference with joint motion, in which this might be the operation of choice. The fixation of fracture with nails of silver or of the ordinary wire type is a simple method, and one which causes very little destruction of bone tissue. The choice depends on the x-ray picture, and the difficulty of correction of the deformity.

A group of four papers by Connell and Freyer,[14] Hernaman-Johnson,[15] Lane,[16] and Taylor[17] in the *Practitioner*, show very clearly, both by clinical description and excellent x-ray pictures, the development of the bone plate in fracture surgery, and the results are surprisingly satisfactory.

We must realize that many of these cases are infected, and that the bone is often shattered in several places, and the gaining scale in the application of these plates is to be especially commended.

We may consider the conclusions drawn by Lane, at the same time recording certain exceptions that the other authors make. Lane says that it is only on very rare occasions that one should try to fix the bones by the means of plates and screws while the wound is very foul. Taylor does not believe that the use of the plate should be attempted in septic cases. If possible, all plating should be postponed until the septic process has been healed. If, at the time of operation, a hidden focus of sepsis is found, effective drainage must be maintained, and the bone plates used should be long enough to allow the screws to be applied as far as possible away from this area. Often a definite gain in the length of the limb can be obtained, and with this point in view it is not necessary to bring the whole area of the broken ends in apposition, since the interval would often fill up, and the callus can be stimulated by inserting fragments of bone.

In these cases, which are liable to be much earlier ambulatory than those in civil life, it is necessary to use much heavier steel plates; in fact, those used now are three times as heavy as those in use before the war period.

Of course Lane lays special importance on the prevention of stiffness of the joints, relying upon the security of the plates, which are made secure by as many screws as it is possible to insert. He begins motions, especially in the lower limb, as soon as any acute swelling has disappeared. Early attempts at walking with a firmly supporting splint stimulate the deposit of bone at the seat of the fracture.

Various methods of bone graft may be used to bridge over the intervening space between the fragments. Lane does not believe that bone grafts alone offer sufficient fixation, and thinks that the many failures of this method are due to the unsatisfactory grip which the graft may have upon the fragments of the shaft. Bone grafts are a great help in bridging the spaces between bones which are firmly immobilized. Lane does not believe that any number of screws properly applied to hold the bone plate in place produces a harmful rarifying osteitis.

The sepsis, which is a great obstacle in these cases, is often successfully treated by autogenous vaccines. A hemorrhage, which is often great, is best controlled by hemostatic forceps, which may be left in the wound, and ligatures are rarely used.

Sever[18] and Hartwell[19] in their papers upon fractures of the spinal vertebrae, call attention to the frequency of the occurrence of the type of fracture, and the importance of its early recognition and treatment. Sever gives a study of seven cases of fracture of the lumbar vertebrae. To within a short time these cases would probably have passed as severe back strains or hypertrophic changes in the spine. The diagnosis in these cases is often very difficult, but it is of the utmost importance for the successful treatment. They may be caused by direct or indirect violence, and the nerve symptoms due to pressure upon the cord may be present at the beginning, but are most often late or entirely absent; the lesser signs of pain and localized tenderness, often appearing three or four weeks later, are quite important. At this time the diagnosis can be made only from the x-rays. Fixation in a plaster jacket or on a Bradford frame, according to the severity of the case, should be carried out for at least six months. Where there is evidence of injury to the cord a laminectomy should be done with little delay.

Hartwell has studied those cases of fracture of the spine which show none of the characteristic symptoms associated with lesions of the cord. There are often only the moderate signs of back strain at first, and the chief symptom is a persistent localized pain in the back, which grows worse month after month. This steady pain in the back, unaccompanied by any neurological symptoms, should lead one to study the x-ray pictures very carefully, and whether or not there is a history of a fall or severe injury. Localized tenderness over the spinous processes or a disalignment of these processes is the most characteristic symptom. Hartwell does not state whether, in his opinion, the treatment should be by plaster jackets or by a bone graft.

(Ed. Note.—In our experience, a bone graft applied to the spinous processes in those cases which show a persistence of the pain and disability has proved a most satisfactory method of treatment, and has permitted an early return to active life.)

BONE REGENERATION AND TRANSPLANTATION.

Dobrovolskaia's[20] experiments with proliferation of bone tissue in the test tube showed that it is possible to obtain an abundant growth *in vitro,* including the endostium, haversian canals, bone cells, etc. The proliferation of osteogenous elements of the cortical substance of the transplanted bone deprived of periosteum gives rise to formation of osteogenous tissue, but this occurs with greater energy when the transplanted bone is not deprived of its periosteum. The newly-formed bone becomes solid only when it grows to blend with the basal bony tissue. The proliferation and further growth of osteogenous elements are facilitated by the presence of a fibrinous blood clot. The practical conclusion is to guard carefully the smallest fragments, in case of a fracture non-complicated by suppuration, and in case of the latter, to remove them as late as possible in order to give the body a chance to utilize them as construction material.

(Ed. Note.—Clinically, these laboratory findings are most notably confirmed by the results obtained in the very extensive compound comminuted gunshot fractures. Fred T. Murphy, in an unpublished communication, has shown that in those cases in which the fragments have been removed, non-union has been very frequent; whereas, in those in which the minutest fragments were left, speedy union has been obtained almost invariably.)

Tongu[21] has made experiments on dogs and rabbits to study the effect of the injection of periosteum and bone marrow. The osteoblasts prove most active when an emulsion of periosteum had been injected or transplanted. They were less active when a segment of bone marrow was transplanted, and least active after an injection or transplantation of an emulsion of bone marrow. The newly-formed bone tissue resulting from the transplantation of periosteum and bone marrow was gradually destroyed by the osteoclasts, disappearing completely in time.

Hawley,[22] in "A Contribution to the Fate of Bone Grafts," reports six cases in which he has tried a new method of applying a bone graft. The results have been principally interesting because the grafts were applied in a site that could be easily studied by the x-ray. He has used the graft in paralytic deformities of the ankle; in cases of equinus, he has placed it on the posterior surface of the ankle joint in order to lock the plantar flexion. It was generally carried well down into the os calcis. In the calcaneo deformity, the graft has been inlaid in front of the joint in order to check the dorsal flexion. The operation was successful in all six cases, healing with first intention, but the two adults complained of pain for some time.

Functional results in all six cases were failures because the graft did not hold, and there was a dissolution of it in every case. Those parts of the graft inlaid in the bone remained alive and strong, while those parts on the joint line disappeared. Hawley does not try to explain these conditions by anything more than theories. He thinks that these failures show some limitations in the field of bone transplantations.

The results in 40 cases of bone grafting for spinal conditions was shown in a report by Rugh.[23] There was no death. One of the cases was cervical tuberculosis, fifteen dorsal, nineteen lumbar, and three in the sacral region. The presence of abscesses, paralysis or irritability of the cord did not contraindicate an operation. One case with pulmonary tuberculosis showed poor result. In one case there resulted a fracture of the graft; in another case the graft was lost; and in a third case there was a fracture of the tibia. The average length of time that the patient remained upon the back was 6 weeks, and the average time for wearing a support was 6 months. The result in 26 cases was excellent; 5 cases were improved; 2 were unrelieved; the others have either not been heard from or died from intercurrent disease.

(Ed. Note.—The author's aim evidently has been that expressed by Lange, to put a brace under the skin and to shorten the time of recovery. We feel that the average length of time in which the patient was restricted, either on his back or with a brace, should be longer than the author suggests. In certain cases of active and extensive tuberculous disease they have broken out afresh after bone grafting.)

WAR SURGERY.

Osgood[24] presents a paper on "Orthopaedic Work in a War Hospital," which is interesting to us from various points of view. In the first place, it shows the value of an orthopaedic service in a war hospital, a thing that was at first considered to be doubtful. This service in a war has added much not only to the knowledge of orthopaedic surgeons, but it has also shown how useful these principles may be, and has brought this fact to the attention of the general surgeon. The great variety assigned to the orthopaedic surgeon offers proof of the value and the appreciation of their work.

Osgood's article also shows to those who are working all the time in orthopaedic surgery a number of new principles used in splinting these emergency cases, which could be made of practical use in our routine work. It is often that we forget the extent to which the different forms of splints may be developed, and do not avail ourselves of the wire mesh, the perforated metal, or the thin aluminum sheets which are so easily adapted to fit individual cases. His very ingenious and adaptable Thomas splint, made of Shelby tubing, which can be adapted to meet almost all emergencies, is something that we should keep in mind.

The article should be carefully read and the illustrations studied in order to appreciate his adaptations of apparatus to support the shoulder, the hand and the foot, and his descriptions of the use of plaster of Paris, reinforced with metal strips so that large fenestra may be left for the observation of wounds.

The broadening of the scope of orthopaedic surgery is shown by the inclusion of nerve surgery in a paper on War Orthopaedics by Hohman, Lange and Schede.[25] In several cases operated upon by Hohman, there was beginning restoration of function five or six weeks after the operation. Lange states that when suture of the nerve does not lead to restoration of function, much may be hoped for from transplantation of tendons. Their paper suggests that the reason of the violent reaction in a joint mobilized under an anesthetic is the hemorrhage that occurs into the joint, and that this may be avoided by the use of an Esmarch bandage.

The need in certain cases of well-directed, but sometimes radical, surgery in severe gunshot wounds is shown in a paper by Bland-Sutton,[26] describing a compound comminuted wound of the upper end of the humerus. The head of the bone was replaced in as nearly its normal position as possible, and the deltoid muscle and the circumflex nerve were repaired as well as possible. The utility of the limb was undoubtedly saved by the operation. It is important that the work should be done before the formation of callus and fibrous tissue has rendered it impossible.

On the other hand, Sehrt[27] emphasizes the value of conservative treatment in certain other cases in which he advocated Bier's stasis hyperaemia. He applies the constrictive bandage once for all, and leaves it day in and day out. When the bandage could be applied within 24 up to 60 hours after the injury, the local and general infection was found to be reduced to a minimum, and in many cases the infection was entirely aborted. The author of the paper is very enthusiastic about this method, and says that since it has been applied in his service in treatment of all severe wounds on arms and legs, there has been no case of gas gangrene from the wound on the extremities. The constricting band is applied no tighter than a plaster bandage. The patient must not feel it as painful and the pulse below must always be palpable. The limb swells below, and may even blister, but the wound is left practically untouched so as not to open new outlays for lymph and blood. The wound is merely covered loosely with gauze, not washed or irrigated, and the limb fastened loosely to a splint or placed flat on a pillow. The pain is promptly arrested, but is liable to return if the limb is raised above the horizontal. As soon as possible, on the fourth or sixth day, the patient must make movements inside the loose dressing. The only surgical measure applied was incision under local anesthesia of a gravity abscess, if such developed. The band is left in place for a week or two.

A paper by Linberger[28] advocates much the same treatment as that described by Sehrt.

In a paper on the treatment of gunshot wounds of long bones and large vessels, complicated with suppuration, Krotkina[29] draws the following conclusions from his experience with the wounded in a large Petrograd hospital: Many gunshot fractures and lesions of the joints heal without any surgical interference. In cases of inflammatory exudates in the joints, Bier's hyperemia treatment must be resorted to, followed, if necessary, by puncture of the joint. Bier's treatment gives good results, even in pyemic states, provided the local process is limited to the joint. When Bier's treatment is used on the knee joint, the popliteal fossa must be carefully guarded. In case cellulitis sets in, the hyperemia treatment must be preceded by large incisions. If continuous and persistent Bier treatment does not prevent or stop suppuration from the joint, the temperature keeping high, good results are often obtained from partial excision of the joint. In case of malignant edema, the general condition being grave, the earliest possible amputation of the limb is indicated.

The value of conservative treatment in certain "Suppurating War Wounds of the Knee" is emphasized by Ponomareff,[30] who decries any attempt to probe or drain the cavity of the knee joint when there is an infectious process in it or such is even suspected. He advocates absolute rest, immobilizing with plaster or splint. If suppuration keeps up, however, he incises and drains the anterior half, following this by incising and draining the posterior half, if this alone does not help. If nothing avails, excision of the joint or amputation of the femur must follow promptly if the infection shows a tendency to spread to adjacent regions.

In two cases of severe suppuration of the leg, Rost[31] has made a ligature of the femoral vein, and believes that this simple operation has saved the life of the patient in each case. He considers that this operation is particularly indicated in suppurative injuries of the extremities when the patients are for some time in grave conditions and when embolic processes have developed or threaten to develop.

Hardonin[32] discusses the etiology and treatment of traumatic talipes equinus, which he says he has seen in hundreds of men as a sequel to wounds of the leg. He is positive that it might have been prevented in 75% of the cases and mitigated in the others. These assertions are sustained by the experience that in certain hospitals this deformity occurs only exceptionally, while in others it is common. Early exercise of the ankle after a wound of the leg is imperative. Even the pressure of the bed clothes, when the men have to stay long in bed, may bring on the deformity, but the usual cause is that the men get up and use the leg too early, stepping on the toes to reduce the pain, and thus fastening the deformity on themselves. Various methods for correcting the established deformity are outlined.

Two cases of this same deformity of talipes equinus following gunshot wounds and sepsis have been treated by Fortunet[33] by cutting off the head of the astragalus, rather than by its removal. He says that the operation is simpler and the results as good.

(Ed. Note.—The editors would suggest that an astragalectomy, with displacement of the foot backwards, might result in a better weight-bearing function than the procedure suggested.)

POLIOMYELITIS.

In a series of lectures, Batten[34] brings out many points which are often overlooked in the treatment of acute cases of poliomyelitis. He considers it an acute specific fever, with an incubation period of 4-12 days, during which time the patient should be isolated; after this time the infectivity is very slight, and in hospitals it is not necessary to place the patient in a separate ward, bed isolation being sufficient to prevent the chance of infection.

Batten believes that, as in typhoid, we can look out for contagion, so in this disease it is essential to pay careful attention to the mucous discharges from the throat and nose. He thinks that it is only through these excreta that the virus may be carried from patient to patient. He considers the use of blood serum from recently recovered cases of poliomyelitis to be of much value in a great many cases, but does not as yet think that we can depend upon it for definite and specific action. He lays special stress upon attention to the early after-treatment, and speaks first of rest. This he thinks is the most important factor. He even says that too early movement may start up a quiescent condition. After three weeks of rest, careful use of the muscles may be allowed. He calls attention to the importance of posture. Many cases are kept immobilized in a splint or other apparatus for months without careful attention being paid to their posture. Muscles which are later expected to resume their normal function should be kept at rest in a position which will prevent any over-stretching or abnormal strain.

Batten uses celluloid splints, accurately fitted to the limb as soon as it is possible to make a cast after the onset of the disease. These splints are carefully made over a plaster cast, which must be formed in a normal position of the limb.

Reëducation is a most important principle of the treatment. In the early stages, badly paralyzed muscles can often be voluntarily put in action while the patient is immersed in a warm bath. When the weight of the limb interferes with voluntary movement, this exercise with the support of the water is of much value. Batten recommends walking exercise in the erect position as the best form for reëducation of the muscles of the trunk. Splints and braces are often necessary, and among other methods of treatment he mentions massage and electricity.

During the last four years, Batten has followed these postural and reëducational lines of treatment in all acute cases, with the result that very few deformities have arisen; those that have been more often noticed were due to the contraction of the flexor muscles of the thigh.

Lovett and Martin[35] report a study of the Vermont epidemic made in December, 1914, where 235 cases were examined; 149 only were of less than six months' duration. The cases were classified according to the severity of the paralysis and note was made of the need of braces, minor operations, and muscular exercises. These cases have since been followed up, and although no systematic treatment has been used, great improvement has been found.

The same authors[36] have described a method of muscle testing to be used in individual cases of paralysis.

(Ed. Note.—The editors believe this may be of great value. They recognize the difficulty of control with certain muscle groups and in young children.)

In a paper on the Serotherapy of Poliomyelitis, Netter[37] reports the results of a series of thirty-two cases in which the patients were treated by means of serum obtained from persons who had had the disease. He regards his results as promising: six rapid and complete cures; three, improvement approximating a complete cure; seven cases of marked improvement; in five others appreciable improvement. Eight of the children died. The injections were made into the spinal canal and were repeated daily for a week. The serum seems to keep its efficiency up to thirty years.

(Ed. Note.—25% of deaths is not less than the average in some of the epidemics, and the recoveries do not seem greater than may be expected under favorable conditions as regards good nursing.)

Gallie[38] makes a further report of his operation of tendon fixation, giving the results in 150 cases. Since the first 20 cases were done, three years have elapsed. He describes the operation briefly as consisting of exposing and isolating the tendon, drawing it taut so as to correct the existing deformity, and burying it in the bone in such a way that when healing takes place the deformity cannot recur. Compared with arthrodesis, it should be preferred in some cases because it restricts the motion in one direction only, that of the deformity. He considers that it gives much more success than tendon transplantation and can be used in a greater variety of cases. The method, however, can be combined with both these operations.

In a study of the results of the non-operative treatment of poliomyelitis in the hospital clinic, O'Reilly[39] reports rather discouraging findings. However, the unfavorable outcome has been due, he believes, to the fact that the treatment suggested has not been well carried out.

(Ed. Note.—This study serves to show the necessity of constant, if not daily supervision, of the work in the training of weakened muscles.)

In a long experimental study of tendon transplantation, with many illustrations showing the methods and the histological results, L. Mayer[40] adds much to our knowledge of this subject. It is not possible to review this article satisfactorily, but after reading it, one feels certain that the rules that Mayer makes in regard to tendon operations should be more carefully followed: First, never operate upon any case unless certain that the after-treatment can be thoroughly and conscientiously carried out under proper directions. The operation may never be considered final with the expectancy that a good result will follow. No matter how careful the technic, adhesions, degenerative changes in the tendon are apt to occur; and these can often be prevented, at least in part, by an early function of the limb. If the operator is satisfied with the physiological fixation of the tendon, exercise can be begun a few days after the operation. The author sometimes implants a silver wire into the muscle at the time of operation so that later electrical stimulation can be obtained more perfectly. In cases where the suture of one tendon to another must be considered ideal fixation, it may be necessary to wait 2-4 weeks before motion is allowed. The transplanted tendon is always barely normal, and it should be strengthened by carefully graded exercise, and often protected by a suitable apparatus, and this exercise, which is so necessary in the after-treatment, must be continued until the transplanted muscle can actually do the work required of it.

In a study of "Implantation of Nerve into the Muscle," Heineke[41] has made experiments on rabbits and can show that functional connection of nerve and muscle is easily obtained already after 1-2 weeks. Faradic reaction begins in several parts of the muscle, and after 4-6 weeks a strong contraction of the whole muscle belly is caused; after 2 months the contraction is practically normal, and the muscle shows no signs of degeneration.

This was also to be noticed when the artificial paralysis had existed for some time, *e.g.*, in a case of 90 days' duration. Five weeks after the implantation, the muscle, which had become degenerated, of yellow color, thin and flaccid, was again of normal color, and could be stimulated in its whole length by the Faradic current. This method, called neurotization by Heineke, does not need any special technic. It is also possible to implant flaps of normal muscles into a paralyzed muscle, and often is found possible when the muscles belong to different nerve zones. Held, a well-known authority in the field ~~of~~ nerve anatomy, has examined the preparations of Heineke, and could find that good connection of the transplanted nerve to the muscles takes place by means of the formation of new end organs, but has not yet been able to decide whether the old nerve sheath had something to do with this process. Further experiments have been made, in that into a normal not paralyzed muscle another motor nerve was implanted, and the effect of the operation was proven after several weeks by a stimulation from the implanted nerve. It was found that it is not possible to implant effectually another nerve into a normal muscle, and Heineke concludes that the implanted nerve can grow in a muscle only by using the old path and nerve sheath.

WEAK FEET.

Grossman[42] reports on a study of 700 cases of weak feet studied in children in kindergarten schools. There is nothing especially new in the contribution, but the study serves to bring to our notice the need of proper care of the feet in early childhood, and shows that, along with the teaching of proper posture, it is necessary to give attention to the need of proper shoes and stockings and proper methods in walking.

For severe flat-foot, Arnd[43] uses a modification of Muller's operation, consisting in transferring and fixing the tendon of the anterior tibial behind the tuberosity of the scaphoid. The lower end of the tendon is not detached.

VISCEROPTOSIS.

Levy and Kantor[44] give the results of their study of a series of 1600 private patients complaining of stomach trouble. Of these, 898 had a routine x-ray examination, that is, what is generally spoken of as a bismuth x-ray of the gastro-intestinal tract. A diagnosis of ptosis was made, either from the fluoroscopic or radiographic examination. The authors have grouped as ptotic those stomachs whose low-lying point, "taken with the patient standing after a bismuth meal," reached one inch below the line joining the tops of the iliac crests. In this series gastroptosis occurred 579 times, 64%; and marked gastroptosis in 46%. The proportion of women to men was 6-5, and the condition occurred more often in individuals under 40 years of age.

The authors think that visceroptosis cannot be ascribed to improper garments or other incidental causes, but is more intimately related to the structure of the body, and probably arises from some congenital predisposition. It is not in itself a disease, and the most marked types need not necessarily prevent the affected organs from performing their proper functions.

BACK CONDITIONS.

In a long review of all the various forms of backache, illustrated with many photographs, Marshall[45] presents many different points of view,—anatomical, physiological, social and economic,—that must be understood for successful management of these cases. He shows a variety of cases and various theoretical conclusions, a study of which may be helpful in understanding some of the types which present all these complications.

Shackleton[46] considers the condition of severe pain in the back due to a large transverse process on the fifth lumbar vertebra, which may or may not impinge upon the sacrum, as a very important but quite uncommon occurrence. He collected 20 cases in which the results of removal by operation had been fairly good. He reports three cases, two of which had complete relief from pain after the transverse process was removed.

Lyon[47] writes from the military convalescent home at Spa, Belgium, to describe seven cases of an inflammatory process in vertebrae during convalescence from typhoid. In only two cases was it severe, with intense pains and swelling of the soft parts and fever. The vertebral affection persisted for two, three, or four months in all, long latent phases alternating with exacerbations. There was very little tendency to suppuration, and the prognosis was favorable, with final complete recovery. He warns that pains in the back during convalescence call for careful examination of the vertebrae. Even mild post-typhoid vertebral affections may be accompanied with great pain, but permanent recovery is the rule.

Schonfeld and Delma[48] have studied the x-ray pictures of 140 cases in order to find out what may be considered as normal and what as abnormal on the lower part of the sacrum and coccyx and their junction. They have found out that conditions which are spoken of as usual in text-books on anatomy are only occasionally found in plates; for instance, the so-called foramen sacrale quintum, which they found only 5 times among 140 cases.

The sacrum and coccyx are very often grown together, whereas a joint is frequently found between the first and second coccygeal. At times the union between sacrum and coccyx is bony only on the lateral parts, and sometimes only on one side, thus representing some kind of a sacro-caudal transitional vertebra. The connection between the bodies is often in the form of a synchondrosis. It has been pointed out that assimilation on the upper end of the vertebra is usually combined with such on its lower end. This, however, has not been proved by the authors.

SYPHILIS OF BONE.

A study of the disproportionate length of the legs in congenital syphilis is reported by Chable,[49] who cites Fournier's statement that he found some syphilitic bone affection in 38.7% of 212 cases of inherited syphilis in children over 2. The tibia was the bone affected in 46.6% of the cases. The trouble may be an osteoperiostitis or a gummatous affection. The bone curves and seems to grow thicker, and Chable has encountered two cases in which, after puberty, the bones grew abnormally long, the tibias being 10 cm. longer than the femurs in one case. This excessive growth had begun at the age of 17. In the other case only one leg had grown to excessive length. The distance from the iliac spine to the malleolus was 86 cm. on this side and 83 cm. on the other. The tibia on this side and in one leg in the other patient was of the typical saber shape, with the characteristic thickening and periosteal exostoses. In the older man (22) the bone substance has encroached on the marrow cavity and already shows signs of eburnification at some points. In the other case the bone shows the characteristic softening, the stage of periostitis with hyperostosis being followed by an inflammatory new growth, which likewise encroaches on the marrow cavity. The whole bone is thicker than normal. The pains and functional disturbances from these changes in the leg bone are liable to be misinterpreted, especially as they may not develop until early adult life. Disproportionate length of the leg below the knee should always suggest possible tardy inherited syphilis.

CONGENITAL DEFORMITIES.

The importance of spina bifida in its relation to postural deformities that may develop in the trunk during later life, *i.e.*, its association with irregular formations of the fifth lumbar vertebra, adds much to the interest of the 16 cases reported by Cates.[50]

Of the sixteen cases in which an operation was performed (two had the meningeal sac removed), there were only seven living two years afterwards. Six died in the first three months after the operation. Several of the cases have grown up to be strong, able-bodied workmen.

Cates considers that most of these cases have a low vitality and a generally poor resistance. He does not make mention of the structural deformity of the fifth lumbar vertebra.

In a case of congenital elevation of the scapula, Peckham[51] reports a satisfactory result which he obtained by dividing the trapezius muscle at the lower angle of the scapula and removing a wedge-shaped piece. After all tissues were sutured, the needle was carried across close to the bone and passed through all the deeper tissues, giving a certain amount of fixation. With chromic catgut sutures this lower angle was drawn down closer to the spinous processes. The result, six months later, was quite satisfactory.

MISCELLANEOUS.

It is yet too early to make any definite statement in regard to the pathology of this condition which has been spoken of as Von Perthes' disease. For a long time these cases have been classed as mild tuberculous affections, but the x-ray shows us a very characteristic picture, which seems to be related to a definite clinical entity.

In the 22 cases reported by Taylor and Frieder[52] there does not seem to be any uniform history of injury, though a mild course which developed in each is characteristic. As they say, the x-ray picture, of course, and the final result are typical. It is a benign affection which needs little treatment, and they consider its cause unknown. Legg, however, shows that in most all his cases there is a definite history of injury, soon followed by a limp with little pain or muscle spasm. The bone destruction is not marked, and the x-ray simply shows a thickening and shortening of the neck of the femur with a destruction or absorption of the epiphysis. Legg argues that the trauma causes an injury to the epiphysis, and that with the disturbance of circulation the bone is either destroyed or changes in its consistency, so that it soon becomes irregular in form. His careful study of a long series of cases bears out all these facts, and it seems probable that we must consider this disease as a trophic condition, usually due to trauma.

(Ed. Note.—The editors believe the careful study of this condition needs to be continued, as undoubtedly some cases still being considered as due to tuberculosis should be included in this group. In this connection it is well to call attention to the fact that this entity, to which the name of Perthes is attached, was first described by Legg of Boston, and later by Calvé of Berck, and that only subsequently did the name of Perthes become associated with it.)

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RECONSTRUCTION BASE HOSPITAL No. 1.

"RECONSTRUCTION" Base Hospital No. 1, for the United States War Department, is to be built here in Boston on Parker Hill, on the site of the old Parker Hill Reservoir, now graded to level, next the Robert B. Brigham Hospital.

Its object is the "reconstruction" of the crippled soldiers, likely to return to us not long hence. This work is special work, not adapted to the general base hospitals at the front or here.

It means the reconstruction, by operation, by apparatus, by education—reëducation—of those who come back with fractures ununited or ill-united, with stiff joints, with nerve palsies from injury or shock—of those who need plastic operations to remedy contractures or defects, or need appliances to supplant a missing limb, and the necessary education in their use.

Most of these men, if discharged early, would be permanent cripples—a burden on the community. It is, therefore, a community problem as well as a military problem.

The Canadian experience indicates that about three-quarters of those invalided home fall in this class,—in the class whose cases the kind of special orthopedic or other treatment to be provided for by this hospital plan is well worth trying in the attempt to make them again fit for the line or for wage-earning at home.

One of the surprises of this war has been the success of both the Allies and the Central Powers in rendering again serviceable thousands of men who would have become derelicts under the old régime. They had a civil machinery and experience better than ours, being older in the field of workmen's compensation. For us this is new and unpredicted work,—a new problem, one our Government has not fully prepared for,—one in which the Government is very ready, busy as it is with the enormous expansion of routine work, to accept outside help.

This Boston hospital for reconstruction, a fully formulated scheme for such help, has been accepted and endorsed by the War Department.

Thanks primarily to the efforts of Dr. Joel Goldthwait, much has already been done.

Mayor Curley has had the Parker Hill Reservoir levelled off (it had long been planned to make this a park—the Mayor saw that this was the time to do it, and did it), and the Robert Brigham Hospital, next door, able to spare something from its wonderful central plant, has agreed to furnish light, heat, kitchen, laundry, chemical laboratory, x-ray plant, etc.

As to professional care, a unit of eleven men has been gathered,—gathered purely on the basis of proved efficiency in the class of work to be provided for.

They are ready, the Brigham Hospital is ready, the site is nearly ready. The War Department is ready to take us over as soon as we are ready to receive patients.

In the meanwhile the community must help. Just now the War Department has no funds applicable to the erection of our buildings.

This erection is our civic problem. Remember, it is not only a war problem; it is a community problem in peace as well as war,—this reconstruction of cripples to usefulness.

Later it may become purely an industrial problem, and we feel sure that our war experience will help mightily in this field to the solution of our problem of accident and disability under peace conditions.

Just now, however, it is war;—and we are concerned with a detail problem in war surgery (very intimately connected with the surgery of industry) which the Central Government—overpressed—has turned over for the moment to local initiative.

Our community is signally honored by the command to go ahead. It seems we are to set the pace in this important work!

We want—for now—four wards of temporary type, of twenty-four beds each. Each will cost about $4000 to build and fit out.

The plans are all ready, not only for this group of buildings we are to start with, but for eventual expansion to five hundred beds when this shall have become a War Department hospital.

We have money enough for one ward already subscribed, and are going ahead on this. Money for three more wards is needed. Everything else is ready. All that lies between us and a very early completion of the small hospital, ready to start in receiving patients as soon as they come, is money.

It is hoped that individuals and associations will interest themselves.

Nothing could be of more service to the cause we are all trying to serve, nothing would redound more to the credit of the community.

Checks or pledges—better checks—may be sent to Mr. Charles S. Rackemann, Ames Building, Boston. F. J. C.

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THE FOOD VALUE OF MEAT PREPARATIONS AND MEAT EXTRACTS.

A GREAT deal of misapprehension still exists as to the food and medicinal values of soups, broths, and the various meat preparations and meat extracts. The laity have a great deal of faith in them, and the profession is not clear enough on the subject to take a positive stand relative to them. While they do no direct harm, they are of harm indirectly because they are relied upon to give a nourishment which it is not in their nature to give, and which might be given except for their use as a food. A review of most of the more recent investigations brings out the fact that practically none of these products has any real food value.

Soups and broths are, of course, widely used as articles of diet. Their main virtue lies not in their food content, but in their flavor. They are condiments rather than foods. One pound of beef cut up and boiled with one-third of a pound of veal bones, and the whole boiled down to one pint of strong soup yields only about 5% of solid matter, consisting of about equal parts of gelatin, fat and extractives, with a little mineral matter. Most clear soups contain not more than 2½% solid matter—at best a negligible amount of solid matter, even if that amount were real food. They have a culinary value as vehicles for starchy or nitrogenous matter—that is, for making thick soups. Moreover, clear soups do act as appetizers, and as such stimulate the gastric juices. In most cases this is not desired. In acute febrile conditions the nature of the diet permitted finds no use for an increase in the amount of the digestive juices.

Of the various beef preparations, beef extracts are best known and most widely used. They are urged upon the public in the guise of highly concentrated foods. About 34 pounds of beef are usually reduced to make one pound of beef extract, and this, in turn, is recommended for the making of about 70 pints of beef tea. Analyses of such preparations show that the total protein content ranges between 14 and 19%. Not more than 7% is albumose. The total nitrogen content is not above 9% (*Lancet*, 1908, ii, 1233). Extractives of the xanthin type form the largest proportion of these preparations—even up to 60%. In these proportions beef extracts are far from concentrated foods. Indeed, they cannot conscientiously be recommended as foods. Beef extracts have neither stimulating effect upon the heart nor upon the nervous system, nor do they have any effect to reduce the time for recovery from fatigue. They, too, like soups and broths, stimulate the gastric juices. Their proper place is in the kitchen rather than at the bedside. In the metabolic diatheses, where there is already an over-production or retention of these meat extractives, the ingestion of extractives in the large quantities contained in these meat preparations can do much harm. It is possible, however, that any benefit derived from the use of these preparations may arise from the presence of vitamine, in which beef is so rich. Even this is but a probability, for it is not unlikely that the vitamine may be rendered inert during the reducing process in the preparation of these extracts.

In regard to the beef juices, when prepared by the warm process, even the small amount of soluble protein becomes coagulated. The cold process at least obviates this difficulty, but there is, on the other hand, the tendency to putrefaction. With neither process, however, is there at best more than 9.5% of protein. The usual range is from .3 to 17%. Some of the poorer qualities of beef juices are nothing more than beef blood. Beef juices containing even 5% of protein would require 3 pints daily to feed an invalid. In circulatory, nephritic or like conditions, this added introduction of fluids into the circulation increases the blood pressure or puts an added tax upon the glomerular epithelium, which might be highly undesirable.

Beef tea can be entirely dismissed as a food or as anything else of value, for it rarely contains more than 1½% of protein. Beef powders, on the other hand, are not really beef preparations in the sense that meats are rendered in their preparation. The whole beef is merely dried and then powdered. The meat protein is present undiminished, but the bulk is reduced. The meat powders are useful in some cases of forced feeding, for long marches and under like circumstances. Under present conditions of food stringency, the destruction of large quantities of food for their preparation is little short of criminal. The abolition of these foods from the dietary of the general public and from that of the invalid would be a step in the direction of rational food economy.

THE MASSACHUSETTS MEDICAL SOCIETY.

To the visiting Fellows of the Massachusetts Medical Society, upon the occasion of this annual meeting, the Boston members of the profession extend, as always, most cordial greeting and hospitable welcome. The circumstances under which the meeting is held this year are of such grave national import that they cannot fail to temper the character and sentiment of the commemorative proceedings. Men have left, or soon will leave us, some of whom never will return; and what in another year may be the situation is matter of equal apprehension and uncertainty.

Notwithstanding these conditions, the scientific program of the Massachusetts Medical Society has been carefully arranged and prepared as usual, and has been fully carried out, with the addition of a new section on hospital administration. Full reports of all proceedings, and the complete text of all the papers presented, and their discussion, will appear systematically in subsequent issues of the JOURNAL. Particular attention is directed to the Annual Discourse by Dr. Truesdale, with its project for the establishment of a chair of military medicine at the Harvard Medical School, which appears as leading article in another column of this issue.

These are restless and perplexing days for all who, like physicians, are earnestly desirous to do their best duty for their country and for humanity in the present crisis. More even than at other times, the Massachusetts Medical Society is at this juncture both symbol and actuality of the united and harmonious profession of our State, zealous in the service of the common welfare whenever and wherever the need for such service may arise.

MEDICAL NOTES.

HEALTH CENTERS IN BUFFALO.—The recently published annual report of the Department of Health of Buffalo, N. Y., contains an interesting account of the organization of its health department into health centers. These health centers are sub-stations of the Department of Health, organized for curative and preventive work in a given district.

"The equipment in all health centers includes an attending medical staff of city physicians, Department of Health nurses detailed from the Bureau of Child Hygiene, and the Tuberculosis Division, a registrar for taking histories and keeping records, Nursing of the district is conducted by the District Nursing Association, who make assignments for the purpose.

The scope of the work includes:

First.—A Well-Baby Clinic, where their nutrition and well-being is supervised and mothers are instructed.

Second.—A Sick-Baby Clinic, where sick children are cared for, malnutrition cases being referred to the Children's Hospital and University of Buffalo service.

Third.—A Nose and Throat, Eye and Ear, and Skin Clinic.

Fourth.—A Medical Clinic, where all cases are treated except venereal diseases, which are referred to the Urologic Hospital, and tuberculosis cases, which are referred to the Tuberculosis Association Dispensary or the Municipal Hospital for treatment and disposition, according to their character, incipient cases being diverted to the J. N. Adam Memorial Hospital at Perrysburg, N. Y.

Fifth.—Prenatal Clinic, where expectant mothers are guided through pregnancy, to secure healthy children and safe confinement.

Sixth.—Free Dental Clinic, with full-time service staff for school children in two health centers (in addition to the city's free dental service at the University of Buffalo).

The health centers are further utilized as distributing centers for milk and eggs, sputum napkins, etc., for tuberculosis cases, and for supplying the profession with laboratory outfits for the examination of pathological secretions, blood tests, etc., and which include Wassermann, Widal, paratyphoid, tuberculosis, pneumonia, diphtheria and gonorrhea examinations, and, finally, for the distribution of typhoid, diphtheria, and anti-tetanus sera. Complaints relative to nuisances and offense are received and transmitted to the general office for suitable action. In addition to ordinary sanitary deficiencies and violations, the investigation emphasized its value in revealing many instances of moral and physical defectives.

Experience shows that the health center brings the Department of Health in close relation with the people and elicits a responsive attitude. It secures the reporting of contagious diseases and lessens their spread. Morbidity and mortality are greatly influenced. Duration of sickness is lessened and restoration to health promoted by securing selective and appropriate hospital and other care for the sick, and by following up cases of convalescence after institutional treatment. Prenatal and child welfare work makes for better individuals, and hospital patronage by pregnant women is increased. Traditional prejudice and distrust of hospitals and dispensaries is offset and hospital care of contagious cases increased."

NATIONAL TUBERCULOSIS ASSOCIATION.—At the meeting of the National Tuberculosis Association, held at Cincinnati, May 9, 10 and 11, Massachusetts was represented by Dr. John B. Hawes, who was appointed as delegate by the Governor. Dr. Arthur K. Stone, President of the Boston Association for Relief and Control of Tuberculosis and Chairman of the Board of Trustees of Hospitals for Consumptives; Dr. Vincent Y. Bowditch; Dr. Walter Griffin of the Sharon Sanatorium; Mr. Seymour H. Stone, Secretary of the Boston Association for Relief and Control of Tuberculosis and of the Massachusetts Anti-Tuberculosis League; Mrs. Mabel G. Smith of Cambridge; and Dr. George L. Schadt of Springfield, were also present from this State. Dr. Hawes read a paper which aroused considerable very interesting discussion, with the following title, "Are Sanatoria Worth While? A Study of the Present Condition of 1056 Patients Discharged from Massachusetts State Sanatoria from May, 1912, to May, 1914." This paper was written by Miss Bernice W. Billings, the after-care worker, and Dr. Hawes.

WAR NOTES.

MENINGITIS AT GREAT LAKES NAVAL TRAINING STATION.—It is reported that during the past six months there have been eighty cases of cerebro-spinal meningitis at the Great Lakes Naval Training Station, resulting in thirty deaths. The commandant at the station states that the percentage of death is less than normal. There are at present ten cases under treatment, six of whom are convalescing. Although the station is designed for only 1,400 men, over 8,000 are being quartered there pending a considerable enlargement of the station. The sick list totals 400 men, most of whom are suffering from minor ailments.

CANADIAN MILITARY HOSPITALS.—It is reported from the Canadian Military Hospitals Commission that there were, on May 22, 6,778 men under its care, including 5,600 convalescents and 720 tuberculosis patients.

AMBULANCE UNITS FROM PENNSYLVANIA.—The students of Pennsylvania State College have made up two ambulance units and have been mustered into Government service for duty in France. They will be trained and equipped in the Allentown concentration camp.

MASSACHUSETTS GENERAL HOSPITAL UNIT.—The following physicians have been commissioned as officers and will accompany the Massachusetts General Hospital Unit to France.

Majs. Frederick A. Washburn, Richard C. Cabot and Lincoln Davis; Capts. Henry C. Marble, Beth Vincent, Zabdiel B. Adams, Richard F. O'Neil, William J. Mixter, Roger Kinnicutt, Albert S. Merrill, Oscar Teague, Frederick C. Irving and Augustus G. Reynolds; 1st Lts. Ralph A. Hatch, DeWitt S. Clark, George A. Ireland, Jr., Harold G. Tobey, James H. Means, George Clymer, Paul D. White, Wade S. Wright, Joseph C. Aub, William H. Gullifer, William H. Sherburne, Edward L. Oliver and Carl Binger.

WAR RELIEF FUNDS.—On June 9 the totals of the principal New England war relief funds reached the following amounts:—

Belgian Fund	$620,604.93
French Wounded Fund	230,626.46
Armenian Fund	189,326.71
Serbian Fund	121,962.66
French Orphanage Fund	107,230.51
Surgical Dressings Fund	97,128.97
Boston Ambulance Fund	84,929.48
Polish Fund	75,361.76
American Children's Fund	51,031.50
Italian Fund	41,538.87
La Fayette Fund	27,038.03
French Phthisis Fund	16,173.34
American Volunteers' Fund	1,563.53
French Musicians' Fund	1,419.92
War Dogs' Fund	474.25

BOSTON AND MASSACHUSETTS.

Week's Death Rate in Boston.—During the week ending June 9, 1917, the number of deaths reported was 224, against 202 for the same period last year, with a rate of 15.12, against 13.85 last year. There were 31 deaths under one year of age, against 40 last year, and 52 deaths over 60 years of age, against 61 last year.

The number of cases of principal reportable diseases were: diphtheria, 96; scarlet fever, 38; measles, 261; whooping cough, 7; typhoid fever, 4; tuberculosis, 45.

Included in the above were the following cases of non-residents: diphtheria, 24; scarlet fever, 6; typhoid fever, 2; tuberculosis, 4.

Total deaths from these diseases were: diphtheria, 7; scarlet fever, 2; measles, 6; typhoid fever, 1; tuberculosis, 27.

Included in the above were the following deaths of non-residents: diphtheria, 1; measles, 1; tuberculosis, 2.

Springfield Academy of Medicine.—At a recent meeting of the Academy of Medicine a committee was appointed on war conditions among physicians. This committee makes the following recommendations.

That physicians of Springfield and vicinity bind themselves to a gentlemen's agreement to the effect:

1. That they will care for the patients of physicians away from the city for patrotic reasons and divide equally the fee when collected with the doctor's family in all such medical cases as would normally fall under the absent physician's care.
2. That the one taking the case will discontinue medical service on such patients and refer them back to the physician on his return; that they agree not to accept calls from such families within a year after this doctor's return, except with his permission.
3. That they will volunteer consultation or special services to the military medical staff when desired.
4. That all physicians keep in close touch with the dependent families of our medical brethren engaged in patriotic service, and if occasion arises in which help is needed, to report the same to this committee in order that the profession may render assistance.
5. That physicians co-operate fully in these matters in order that absent confrères and their families may render assistance.

(Signed): Harvey W. Van Allen,
Thomas G. Alcorn,
Ralph B. Ober.

Social Work at the Boston City Hospital.—A report of the Social Service Department of the Boston City Hospital, recently published, covers the period from February 1, 1916, to January 31, 1917. It states that since the organization of this department, three years ago, the work with child patients has been emphasized; first, because this work is more hopeful and preventive, and second, because the numbers involved were relatively so much smaller as to make it possible to try out schemes of organization. The director, Miss Gertrude L. Farmer, states:

"From the beginning I have had a strong desire to organize and develop the various forms of social service for the children who come to the City Hospital. Health work for these little patients is both more appealing, more hopeful, and more truly economical than with certain other groups with whom we deal. The community is rich in resources that can be called upon to supplement the medical plans for their welfare.

"We are not yet able to speak with certainty as to the number of children treated here yearly. I think it will be found to be between 6,000 and 8,000, new patient and first visits, including House, Out-Patient, and South Departments. Of the 2625 patients admitted to the latter in 1916, 2190 were under 15.

"As would be expected, the two largest groups of children are those with medical diseases, like pneumonia, typhoid, etc., and those with surgical diseases, as empyema, osteomyelitis, and including fractures and other accidents.

"Taking the birthplace of the father with that of the child, there were 17 different nationalities among 457 children. In 366 families the average group was 6 members. The weekly income $15.87, number of rooms 4, monthly rent $12.59.

"254, or 52 per cent. of the 490 children, had been known to a social agency before admission. The families of 118, or 46 per cent. of these 254 children, were being actively dealt with at the time we first knew them.

"Our work with these children included 446 visits to the homes, 135 to co-operating agencies. They were followed upon discharge, when necessary, either in the City Hospital Out-Patient Department, or through other medical agencies like the Boston Consumptive Hospital Department, the Instructive District Nursing or Baby Hygiene Associations."

Worcester City Hospital.—The forty-sixth annual report of the trustees of the Worcester City Hospital states that for the year ended November 30, 1916, the hospital admitted 2,330 patients to its surgical wards, 1,901 patients to its medical wards and 6,074 to the out-patient department. The number of patients admitted to the maternity service was 512. The number occupying private rooms was 598. The training school graduated thirty-nine pupils. The school offers its courses not only to women but to men, who receive the same lectures and instruction as that given to women, with the elimination of the care of women and children and of service in the maternity, children's and isolation departments.

PROTECTION FROM SMALLPOX.—The Health Department of the City of Boston has issued a letter to physicians throughout the State, warning them of the occurrence of smallpox and urging them to advise vaccination of their patients and others. Unvaccinated persons, including all children, should be vaccinated. The letter also asks for the reporting of any doubtful or suspicious eruptions and every case of chicken pox.

TUBERCULOSIS SANATORIA IN MASSACHUSETTS.—The annual report of the trustees of Massachusetts Hospitals for Consumptives states that the four sanatoria under their control have provided beds for nearly 1,100 patients, giving a total of 393,267 days of treatment for 2,525 patients. The waiting list, though not so long as last year, is still distressingly long. There are 250 men and women on the list at the present time. It is necessary for men to wait two months and women a slightly shorter time before they can be admitted. Although local accommodations in the way of municipal hospitals, etc., are constantly being increased, the demand on the State sanatoria is not diminished, but the reverse is true. This does not necessarily mean that tuberculosis in this State is increasing, but is a hopeful sign that more cases than heretofore are being diagnosed and are seeking sanatorium treatment.

Correspondence.

THE BENEDICT TEST.

Boston, June 4, 1917.

Mr. Editor:

Since the introduction of the Allen treatment for diabetes, more and more patients are being educated in the method of testing their urine, which allows them to watch themselves more closely, and better results are naturally obtained. As a result, many drug concerns are making the Benedict solution, which, on account of its being a single solution, is much easier for patients to use.

Recently I have had two instances where the Benedict solution was absolutely unreliable, and for that reason it seems wise to let the medical profession know in order to avoid any serious mistakes. The following, a copy from the card published by Thomas Groom and Company in Boston, and gotten up by Dr. E. P. Joslin, is an exact copy of the card which is given by Dr. Joslin to his patients, giving the correct prescription for the Benedict solution and detailed directions for testing the urine:

FORMULA AND DIRECTIONS FOR THE BENEDICT TEST.

Copper sulphate (pure crytallized)	17.3 g.
Sodium or potassium citrate	173.0 g.
Sodium carbonate (crystallized)*	200.0 g.
Distilled water to make	1000.0 c.c.

* One half the weight of anhydrous salt may be used.

The citrate and carbonate are dissolved together (with the aid of heat) in about 700 c.c. of water. The mixture is then poured (through a filter) if necessary, into a larger beaker or casserole. The copper sulphate (which should be dissolved separately in about 100 c.c. of water) is then poured slowly into the first solution, with constant stirring. The mixture is then cooled and diluted to one liter. This solution keeps indefinitely.

For the detection of glucose in the urine, about 5 c.c. of the reagent are placed in a test-tube and 8 to 10 drops (not more) of the urine to be examined are added. The mixture is then heated to vigorous boiling, kept at this temperature for one or two minutes, and allowed to cool spontaneously. In the presence of glucose, the entire body of the solution will be filled with a precipitate, which may be red, yellow or greenish in tinge. If the quantity of glucose be low (under 0.3%) the precipitate forms only on cooling. If no sugar be present, the solution either remains perfectly clear, or shows a faint turbidity that is blue in color, and consists of precipitated urates. The chief points to be remembered in the use of the reagent are (1) the addition of a small quantity of urine (8 to 10 drops) to 5 c.c. of the reagent, this being desired, not because larger amounts of normal urine would cause reduction of the reagent, but because more delicate results are obtained by this procedure, (2) vigorous boiling of the solution after addition of the urine, and then allowing the mixture to cool spontaneously, and (3) if sugar be present the solution (either before or after cooling) will be filled from top to bottom with a precipitate, so that the mixture becomes opaque.

It is often convenient to perform the test by placing the tube containing the mixture of the solution and urine in bubbling, boiling water, where it must remain with the water actually boiling for five minutes. Yours very truly,

F. GORHAM BRIGHAM.

BELGIAN PHYSICIANS' RELIEF FUND.

REPORT OF THE TREASURER OF THE COMMITTEE OF AMERICAN PHYSICIANS FOR THE AID OF THE BELGIAN PROFESSION, FOR THE QUARTER ENDING MAY 31, 1917.

No contributions.

Previously reported receipts	$7,961.26
Total receipts	$7,961.26
Previously reported disbursements:	
1,625 standard boxes of food at $2.20	$3,575.00
1,274 standard boxes of food at $2.30	2,930.20
353 standard boxes of food at $2.28	804.84
Total disbursements	$7,310.04
Balance	$651.22

F. F. SIMPSON, M.D., *Treasurer*,
7048 Jenkins Arcade Building,
Pittsburgh, Pa.

RECENT DEATHS.

HOLMES MAYHEW JERNEGAN, M.D., of Boston, died at his home on May 27. Dr. Jernegan was born in Edgartown, Mass., on August 3, 1846, and graduated from the New York Homeopathic Medical College. He began practice in New York City, and after four years removed to Boston, where he had been engaged in his profession ever since. He was lecturer on surgical anatomy and clinical surgery at the Massachusetts Homeopathic Hospital from 1870 to 1873. For five years he was professor of surgery in Boston University Medical School. Dr. Jernegan was a member of the Massachusetts Surgical and Gynecological Society and of the Bostonian Society. He is survived by his widow.

JOHN CHARLES O'BRIEN, JR., M.D., a recently admitted Fellow of the Massachusetts Medical Society, died at his home in Greenfield of pneumonia, following an operation for appendicitis, May 23, 1917, at the age of 26. He was born in Amsterdam, N. Y., was educated in Greenfield and at Tufts College Medical School, 1914, and had served as house physician at Mercy Hospital, Springfield. He had begun practice in the office with his father in Greenfield.